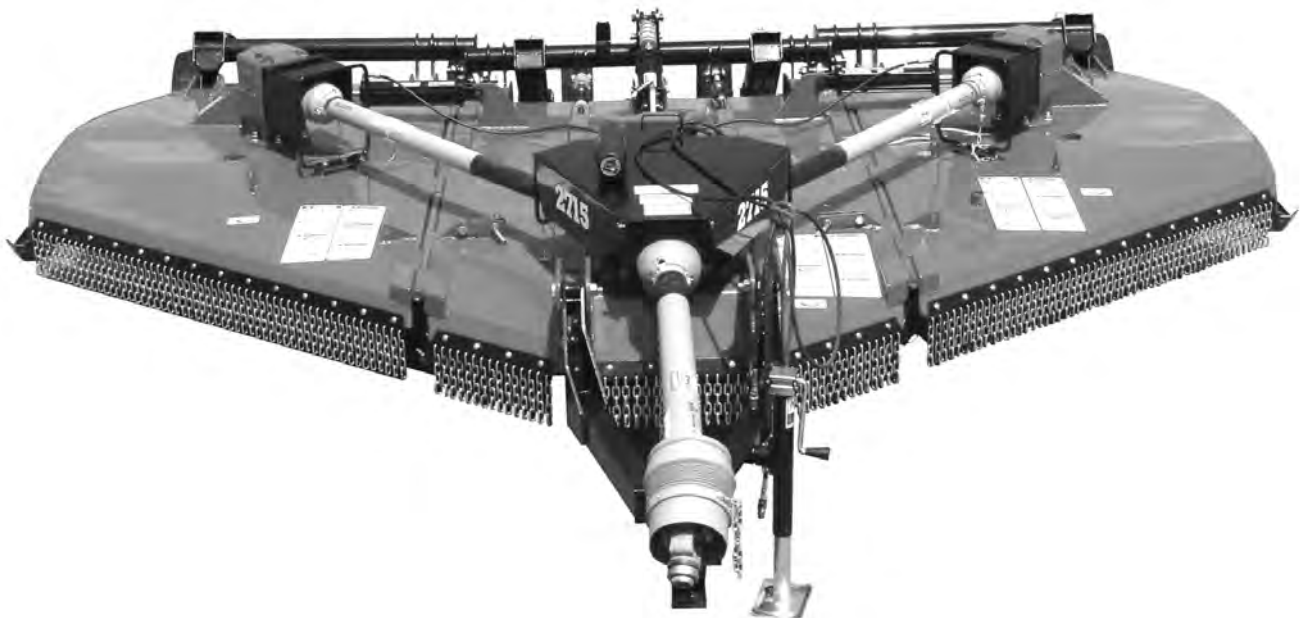


BUSH HOG®

Model 2715 / 2710 Flex-Wing Rotary Cutter Operator's Manual



BUSH HOG®
Performance You Can Count OnSM

ASSEMBLY • OPERATION • MAINTENANCE

CONGRATULATIONS!

You have invested in the best implement of its type on the market today.

The care you give your Bush Hog implement will greatly determine your satisfaction with its performance and its service life. We urge a careful study of this manual to provide you with a thorough understanding of your new implement before operating, as well as suggestions for operation and maintenance.

If your manual should become lost or destroyed, Bush Hog will be glad to provide you with a new copy. Order from Bush Hog, 2501 Griffin Ave., Selma, Alabama 36703. Most of our manuals can also be downloaded from our website at www.bushhog.com

As an authorized Bush Hog dealer, we stock genuine Bush Hog parts which are manufactured with the same precision and skill as our original equipment. Our trained service personnel are well informed on methods required to service Bush Hog equipment, and are ready and able to help you.

Should you require additional information or assistance, please contact us.

YOUR AUTHORIZED
BUSH HOG DEALER

BECAUSE BUSH HOG MAINTAINS AN ONGOING PROGRAM OF PRODUCT IMPROVEMENT, WE RESERVE THE RIGHT TO MAKE IMPROVEMENTS IN DESIGN OR CHANGES IN SPECIFICATIONS WITHOUT INCURRING ANY OBLIGATION TO INSTALL THEM ON UNITS PREVIOUSLY SOLD.

BECAUSE OF THE POSSIBILITY THAT SOME PHOTOGRAPHS IN THIS MANUAL WERE TAKEN OF PROTOTYPE MODELS, PRODUCTION MODELS MAY VARY IN SOME DETAIL. IN ADDITION, SOME PHOTOGRAPHS MAY SHOW SHIELDS REMOVED FOR PURPOSES OF CLARITY. **NEVER OPERATE THIS IMPLEMENT WITHOUT ALL SHIELDS IN PLACE.**

2715 ROTARY CUTTER

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RETAIL CUSTOMER'S RESPONSIBILITY UNDER THE BUSH HOG WARRANTY

It is the Retail Customer and/or Operator's responsibility to read the Operator's Manual, to operate, lubricate, maintain and store the product in accordance with all instructions and safety procedures. Failure of the operator to read the Operator's Manual is a misuse of this equipment.

It is the Retail Customer and/or Operator's responsibility to inspect the product and to have any part(s) repaired or replaced when continued operation would cause damage or excessive wear to other parts or cause a safety hazard.

It is the Retail Customer's responsibility to deliver the product to the authorized Bush Hog Dealer, from whom he purchased it, for service or replacement of defective parts which are covered by warranty. Repairs to be submitted for warranty consideration must be made within forty-five (45) days of failure.

It is the Retail Customer's responsibility for any cost incurred by the Dealer for traveling to or hauling of the product for the purpose of performing a warranty obligation or inspection.



LIMITED WARRANTY



Bush Hog warrants to the original purchaser of any new Bush Hog equipment, purchased from an authorized Bush Hog dealer, that the equipment be free from defects in material and workmanship for a period of one (1) year for non-commercial, state and municipalities' use and ninety (90) days for commercial use from date of retail sale. Model 2715 / 2710 gearboxes are covered by a five (5) year limited warranty period. The obligation of Bush Hog to the purchaser under this warranty is limited to the repair or replacement of defective parts.

Replacement or repair parts installed in the equipment covered by this limited warranty are warranted for ninety (90) days from the date of purchase of such part or to the expiration of the applicable new equipment warranty period, whichever occurs later. Warranted parts shall be provided at no cost to the user at an authorized Bush Hog dealer during regular working hours. Bush Hog reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

DISCLAIMER OF IMPLIED WARRANTIES & CONSEQUENTIAL DAMAGES

Bush Hog's obligation under this limited warranty, to the extent allowed by law, is in lieu of all warranties, implied or expressed, **INCLUDING IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE** and any liability for incidental and consequential damages with respect to the sale or use of the items warranted. Such incidental and consequential damages shall include but not be limited to: transportation charges other than normal freight charges; cost of installation other than cost approved by Bush Hog; duty; taxes; charges for normal service or adjustment; loss of crops or any other loss of income; rental of substitute equipment, expenses due to loss, damage, detention or delay in the delivery of equipment or parts resulting from acts beyond the control of Bush Hog.

THIS LIMITED WARRANTY SHALL NOT APPLY:

1. To vendor items which carry their own warranties, such as engines, tires, and tubes.
2. If the unit has been subjected to misapplication, abuse, misuse, negligence, fire or other accident.
3. If parts not made or supplied by Bush Hog have been used in connection with the unit, if, in the sole judgement of Bush Hog such use affects its performance, stability or reliability.
4. If the unit has been altered or repaired outside of an authorized Bush Hog dealership in a manner which, in the sole judgement of Bush Hog, affects its performance, stability or reliability.
5. To normal maintenance service and normal replacement items such as gearbox lubricant, hydraulic fluid, worn blades, or to normal deterioration of such things as belts and exterior finish due to use or exposure.
6. To expendable or wear items such as teeth, chains, sprockets, belts, springs and any other items that in the company's sole judgement is a wear item.

NO EMPLOYEE OR REPRESENTATIVE OF BUSH HOG IS AUTHORIZED TO CHANGE THIS LIMITED WARRANTY IN ANY WAY OR GRANT ANY OTHER WARRANTY UNLESS SUCH CHANGE IS MADE IN WRITING AND SIGNED BY BUSH HOG'S SERVICE MANAGER, 2501 GRIFFIN AVE., SELMA, ALABAMA 36703.



Record the model number, serial number and date purchased. This information will be helpful to your dealer if parts or service are required.

MODEL NUMBER _____

MAKE CERTAIN THE WARRANTY INFORMATION HAS BEEN FILED ONLINE WITH BUSH HOG SELMA, ALABAMA

SERIAL NUMBER _____

DATE OF RETAIL SALE _____

DEALER PREPARATION CHECK LIST

2715 / 2710 ROTARY CUTTER

BEFORE DELIVERING MACHINE — The following check list should be completed.
Use the Operator's Manual as a guide.

- ☐ 1. Assembly completed.
- ☐ 2. Gearbox filled with oil.
- ☐ 3. All fittings lubricated.
- ☐ 4. All shields in place and in good condition.
- ☐ 5. All fasteners torqued to specifications given in Torque Chart.
- ☐ 6. Slip clutches have been checked for proper operation.
- ☐ 7. All decals in place and readable. (See decal page.)
- ☐ 8. Overall condition good (i.e. paint, welds)
- ☐ 9. Operators manual has been delivered to owner and he has been instructed on the safe and proper use of the cutter.
- ☐ 10. Warranty information has been filed online with Bush Hog.
- ☐ 11. Purchaser or dealer elects to delete deflectors. (front belting, rear bands, front and rear chains)

Explanation: _____

- ☐ 12. Purchaser or dealer elects to delete tow chain.

Explanation: _____

WARNING

For Non-Agricultural use, OSHA, ASAE, SAE and ANSI standards require the use of Chain Guards or other protective guards at all times. Bush Hog strongly recommends the use of such guards for Agricultural uses as well, to reduce the risk of property damage, serious bodily injury or even death from objects thrown out by or from contact with the cutting blades.

Dealer's Signature _____

Purchaser's Signature _____

THIS CHECKLIST TO REMAIN IN OWNER'S MANUAL

It is the responsibility of the dealer to complete the procedures listed above before delivery of this implement to the customer.

IMPORTANT SAFETY PRECAUTIONS

This symbol is used to call attention to safety precautions that should be followed by the operator to avoid accidents. When you see this symbol, carefully read the message that follows and heed its advice. Failure to comply with safety precautions could result in serious bodily injury.



In addition to the design and configuration of equipment, hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel in the operation, transport, maintenance and storage of equipment. Lack of attention to safety can result in accident, personal injury, reduction of efficiency and worst of all—loss of life. Watch for safety hazards and correct deficiencies promptly. Use the following safety precautions as a general guide to safe operations when using this machine. Additional safety precautions are used throughout this manual for specific operating and maintenance procedures. Read this manual and review the safety precautions often until you know the limitations.

1. Read the Operator's Manual. Failure to read the Operator's Manual is considered a misuse of this equipment.
2. Become familiar with all the machine's controls and all the caution, warning and danger decals affixed to the machine before attempting to start or operate.
3. Before starting or operating the machine, make a walk around inspection and check for obvious defects such as loose mounting bolts and damaged components. Correct any deficiency before starting.
4. Do not allow children to operate the cutter. Do not allow adults to operate it without proper instruction.
5. Do not carry passengers.
6. Keep the area of operation clear of all persons, particularly small children and pets. The operator should cease mowing whenever anyone comes within the operating area.
7. Clear the work area of objects which might be picked up and thrown.
8. Use a piece of cardboard or wood rather than hands to search for hydraulic leaks. Escaping hydraulic oil under pressure can penetrate skin. If fluid is injected into the skin, it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.
9. Do not operate without all guards and shields in place and in good condition.
10. Lower implement to ground, stop tractor engine, apply parking brake, and allow blades to completely stop before leaving the tractor.
11. Keep hands and feet away from blades.
12. This cutter is not to be operated along highways or in any area where people may be present unless all sides of the unit are enclosed by permanent bands, safety chains or other factory approved safety shields that are in good repair.
13. Wear personal protective equipment such as, but not limited to, protection for eyes, ears, feet, hands and head when operating or repairing the equipment. Do not wear loose clothing or jewelry that may catch on equipment moving parts.
14. When performing adjustments or maintenance on the cutter, first lower it to the ground or block it securely at a workable height.
15. Never stand between tractor and cutter while tractor is being backed to the cutter hitch.
16. Reduce speed when transporting cutter to avoid bouncing and momentary loss of steering.
17. Use tractor flashing warning lights, day or night, when transporting cutter on road or highways unless prohibited by law.
18. Stand clear of wing(s) when raising or lowering.
19. Purge air from hydraulic system before attempting to raise or lower wings.
20. In the event that someone other than yourself will operate this equipment we firmly suggest that all SAFETY references be discussed prior to operation.
21. It is recommended that tractor be equipped with Rollover Protective System (ROPS) enclosed cab, and a seat belt.

IMPORTANT FEDERAL LAWS AND REGULATIONS* CONCERNING EMPLOYERS, EMPLOYEES AND OPERATIONS.

*(This section is intended to explain in broad terms the concept and effect of the following federal laws and regulations. It is not intended as a legal interpretation of the laws and should not be considered as such).

U.S. Public Law 91-596 (The Williams-Steiger Occupational and Health Act of 1970) OSHA

This Act Seeks:

“...to assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources...”

DUTIES

Sec. 5 (a) Each employer—

- (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees;
- (2) shall comply with occupational safety and health standards promulgated under this Act.
 - (b) Each employee shall comply with occupational safety and health standards and all rules, regulations and orders issued pursuant to this Act which are applicable to his own actions and conduct.

OSHA Regulations

Current OSHA regulations state in part: “At the time of initial assignment and at least annually thereafter, the employer shall instruct every employee in the safe operation and servicing of all equipment with which the employee is, or will be involved.” These will include (but are not limited to) instructions to:

Keep all guards in place when the machine is in operation;

Permit no riders on equipment;

Stop engine, disconnect the power source, and wait for all machine movement to stop before servicing, adjusting, cleaning or unclogging the equipment, except where the machine must be running to be properly serviced or maintained, in which case the employer shall instruct employees as to all steps and procedures which are necessary to safely service or maintain the equipment.

Make sure everyone is clear of machinery before starting the engine, engaging power, or operating the machine.

EMPLOYEE TRACTOR OPERATING INSTRUCTIONS:

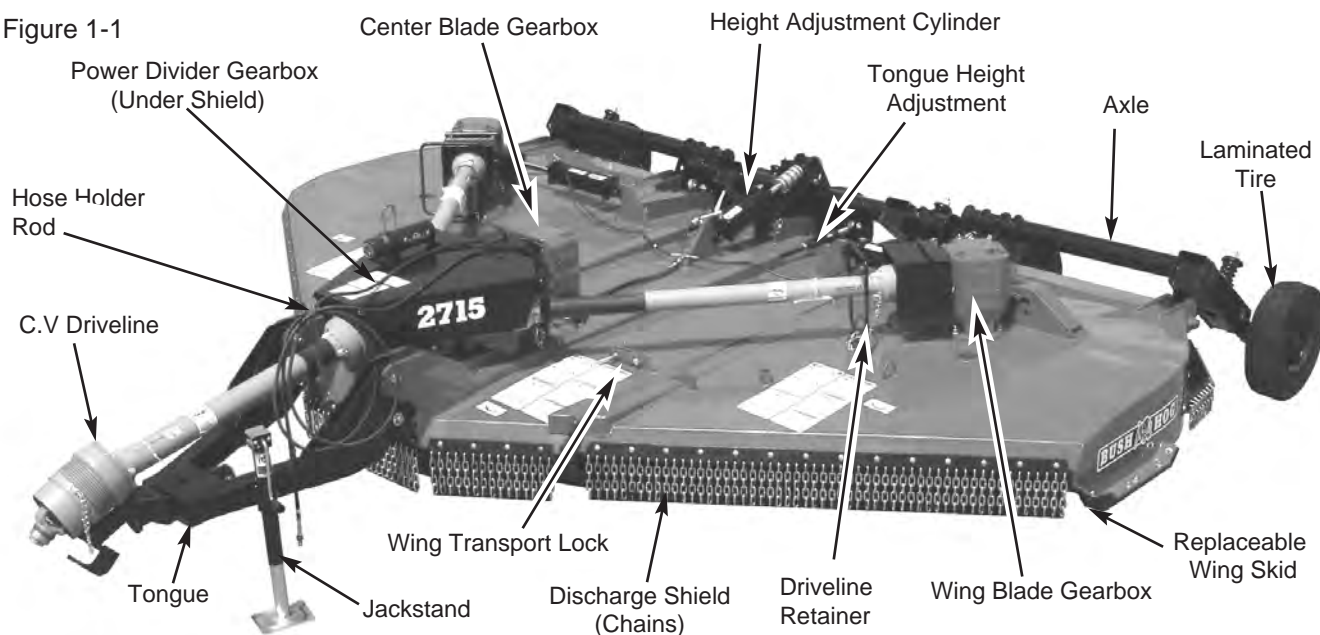
1. Securely fasten your seat belt if the tractor has a ROPS.
2. Where possible, avoid operating the tractor near ditches, embankments, and holes.
3. Reduce speed when turning, crossing slopes, and on rough, slick, or muddy surfaces.
4. Stay off slopes too steep for safe operation.
5. Watch where you are going, especially at row ends, on roads, and around trees.
6. Do not permit others to ride.
7. Operate the tractor smoothly - no jerky turns, starts, or stops.
8. Hitch only to the drawbar and hitch points recommended by tractor manufacturers.
9. When tractor is stopped, set brakes securely and use park lock if available.

Child Labor Under 16 Years Old

Some regulations specify that no one under the age of 16 may operate power machinery. It is your responsibility to know what these regulations are in your own area or situation. (Refer to U.S. Dept. of Labor, Employment Standard Administration, Wage & Home Division, Child Labor Bulletin #102.)

SECTION I INTRODUCTION AND DESCRIPTION

Figure 1-1



1-1 INTRODUCTION

We are pleased to have you as a Bush Hog customer. Your Model 2715/2710 Flex Wing Rotary Cutter has been carefully designed to give maximum service with minimum down time. This manual is provided to give you the necessary operating and maintenance instructions for keeping your rotary cutter in top operating condition. Please read this manual thoroughly. Understand what each control is for and how to use it. Observe all safety precautions decaled on the machine and noted throughout the manual for safe operation of implement. If any assistance or additional information is needed, contact your authorized Bush Hog dealer.

NOTE

All references made in this manual to right, left, front, rear, top or bottom are as viewed facing the direction of forward travel with implement properly attached to tractor.

1-2 DESCRIPTION

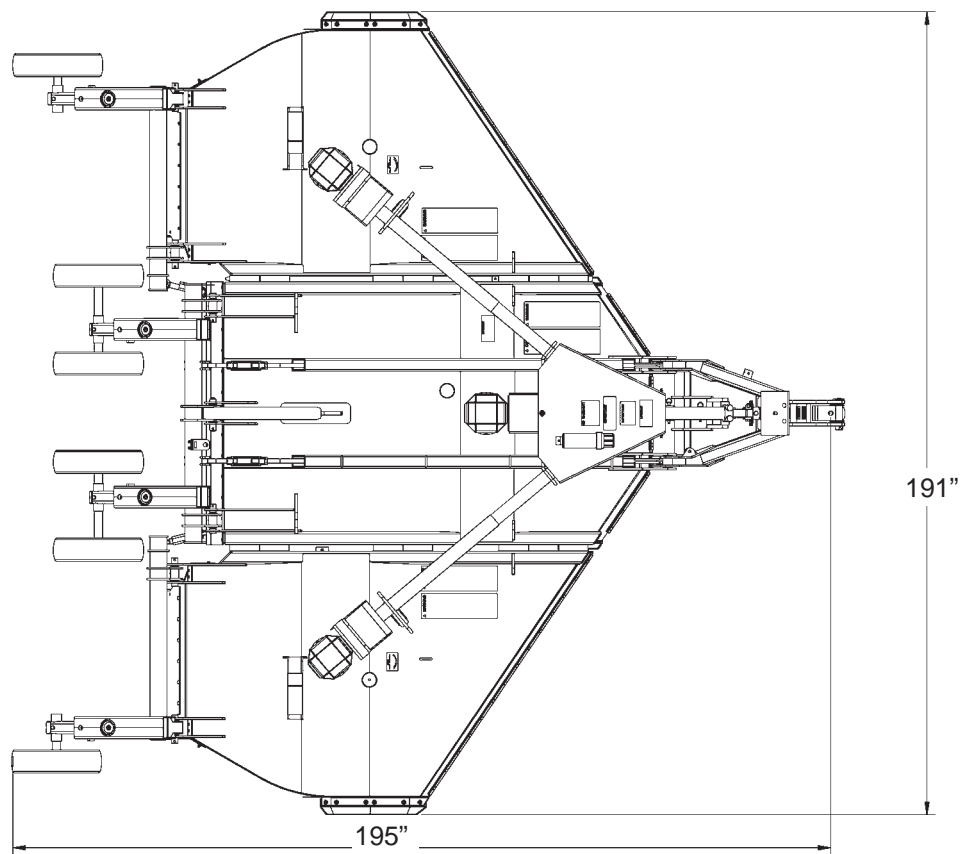
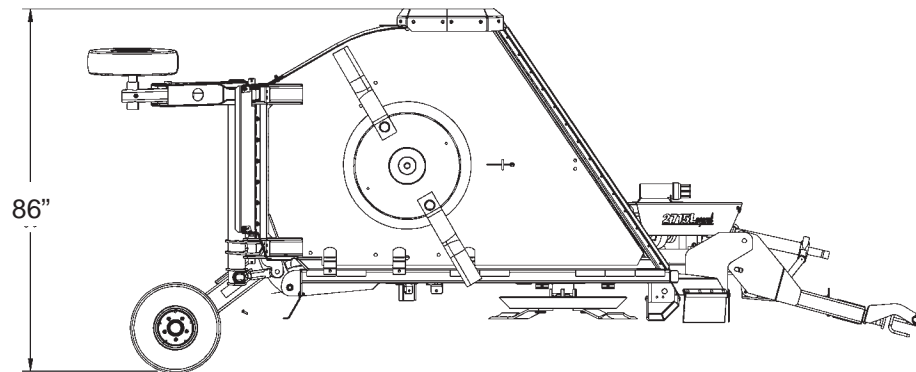
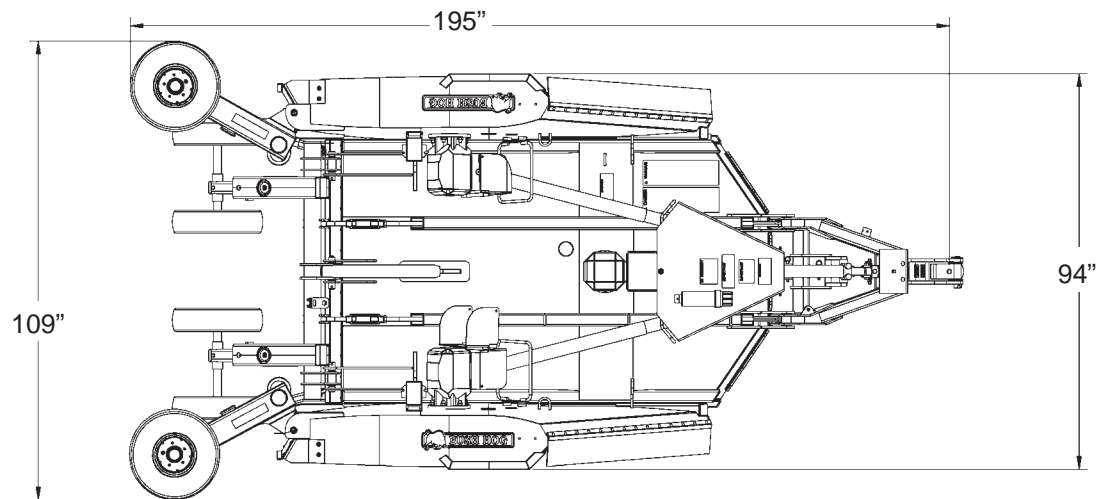
The Model 2715 Rotary Cutter (Figure 1-1) consists of a center unit with two variable position wings together having a cutting width of 15 feet (4.6m). The Model 2710 Rotary Cutter consists of a center unit with one variable position wing together having a cutting width of 10-1/2 feet (3.2m). Wing operating angles and machine cutting height are independently controlled using hydraulic cylinders. A self-leveling linkage maintains a level cutter at all cutting heights.

Power from the tractor PTO is split at the power divider gearbox and supplied to each of the blade gearboxes. Each blade gearbox has two free-swinging uplift blades designed to cut grass, corn stalks and light brush. Free-swinging blades reduce the shock of impact when a stationary object is hit. Slip clutches are installed on each gearbox for additional protection. Front and rear discharge shields are included as standard equipment. **(Note: Dealer or purchaser may elect to delete at their option).** Machine specifications are given in Table 1-1.

TABLE 1-1 SPECIFICATIONS

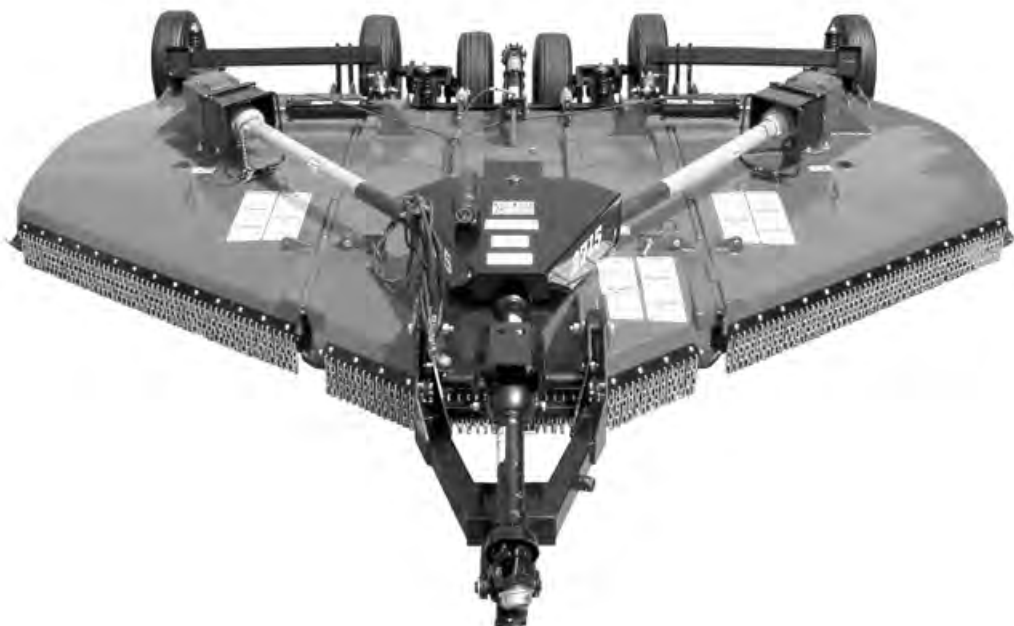
Length	.....195 in. (495.3 cm)
Transport Width	.....109 in. (276.8 cm)
Transport Height	......86 in. (214.4 cm)
Working Width	.....191 in. (485.1 cm)
Cutting Height	......2-14 in. (5.1 - 35.6 cm)
Cutting Capacity	......3-1/2" (8.89 cm)
Blades	......1/2 x 4 in. (12.7 x 101.6 mm) uplift
Blade Overlap	......6 in. (15.2 cm)
Blade Tip Speed	.....16,000 FPM
Gearbox Horsepower	.....Power divider 235 HP Center & Wing Gearbox 205 HP
Minimum Required	
Tractor Horsepower	......60 HP
Wing Angles	......87° up to 22° down
Hitch	.....Perma Level standard, 2" Ball or Cast Clevis
Gearbox Input Shafts	......1-3/4" (44.4 mm)

2715 Dimensions



KEY OPERATION POINTS

- Cutting performance and distribution are best when cutter is level from side to side and front to rear.
- In extra heavy material, rear chains will allow better discharge and better distribution than solid rear bands.
- Never operate the Flexwing below full PTO speed of 540 or 1000 rpm.
- For good distribution, the distribution baffles must be used.
- Deck rings may influence the quality of distribution.
- Deck rings will cause additional mulching in heavy grass and corn stalks.
- Corn should be cut at 5 to 6 mph. If full PTO rpm cannot be maintained, use one lower gear.
- Corn yield of 180 bu. per acre will require a minimum of 105 pto horsepower to shred at 5 to 6 mph. To maintain the suggested 5 to 6 mph ground speed when cutter is equipped with deck rings, a minimum pto horsepower of 115 is recommended.
- **ALWAYS OPERATE WITH THE WING HYDRAULIC CYLINDER CONTROL VALVES IN A FLOAT POSITION.**

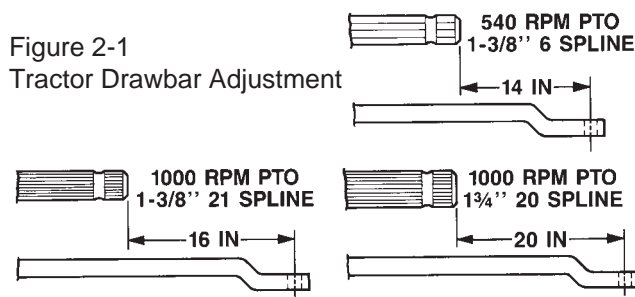


SECTION II PREPARATION FOR USE

2-1 ATTACHING TO TRACTOR

A. **IMPORTANT** - Adjust tractor drawbar length to dimension shown in Figure 2-1. Incorrect drawbar length will change angle of driveline causing possible damage to constant velocity joint. Do not use PTO adapters. Use of PTO adapters will invalidate your warranty. See operator's manual for drawbar adjustment procedures.

Bush Hog offers a driveline to match your tractor PTO shaft. The proper driveshaft should always be used instead of a PTO adapters.



B. Raise cutter using jackstand until tongue is at drawbar height.

C. Connect cutter to tractor using 1-inch (25.4mm) diameter approved pin with lynch pin retainer or equivalent.

D. **If connecting cutter hydraulic lines directly to tractor, wing hydraulic lines must be connected to tractor outlets that permit flotation of wings.**

E. If optional valve is used, mount as desired. If optional valve mounting bracket is used with valve, attach to tractor as described in paragraph 2-2.

F. Connect hydraulic lines to tractor auxiliary outlet(s)

WARNING

USE A PIECE OF CARDBOARD OR WOOD RATHER THAN HANDS AND WEAR EYE PROTECTION WHEN SEARCHING FOR HYDRAULIC LEAKS. ESCAPING HYDRAULIC OIL UNDER PRESSURE CAN PENETRATE SKIN. IF OIL IS INJECTED INTO SKIN, IT MUST BE SURGICALLY REMOVED WITHIN A FEW HOURS BY A DOCTOR OR GANGRENE MAY RESULT.



G. Unpin wing lift cylinders at rod end. Fully extend cylinders by pulling on clevis. Retract cylinders using hydraulic valve. This removes most of the air from cylinder. Repin cylinders.

H. Attach driveline on tractor and cutter with constant velocity joint at tractor. Pull on each driveline section to be sure yokes lock into place. Make certain driveline shielding is in place and in good condition.

I. **Attach driveline shield chains from both ends of driveline shielding to stationary location.** NOTE: The shield around the constant velocity joint should not be chained in place.

J. Remove jackstand and pin in storage position

2-2 OPTIONAL VALVE MOUNTING BRACKET INSTALLATION (Figure 23)

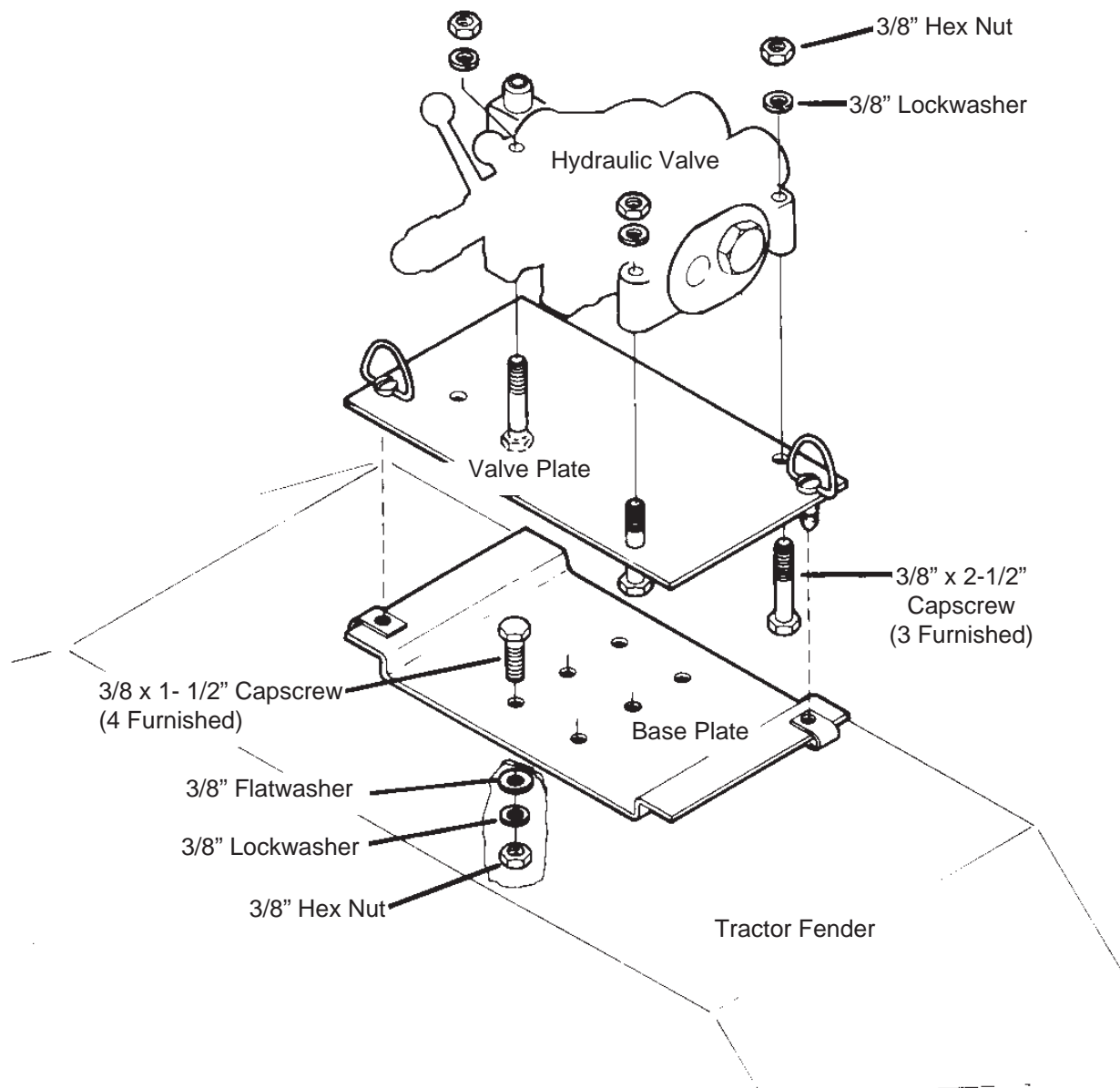
A. Place bottom bracket at desired mounting location. Mark 2-4 holes (as needed) for drilling using bracket as pattern. Drill holes using 13/32 drill bit.

B. Mount lower bracket using four 3/8 x 1-1/2" bolts, nuts, flatwashers and lockwashers.

C. Attach valve to top bracket using three 3/8" x 2-1/2" bolts, nuts and lockwashers.

D. Mount top bracket to bottom bracket using quarter turn fasteners. Insert quarter turn fastener into clip-on receptacle and turn 90 degrees.

Figure 2-3 Valve Bracket Installation



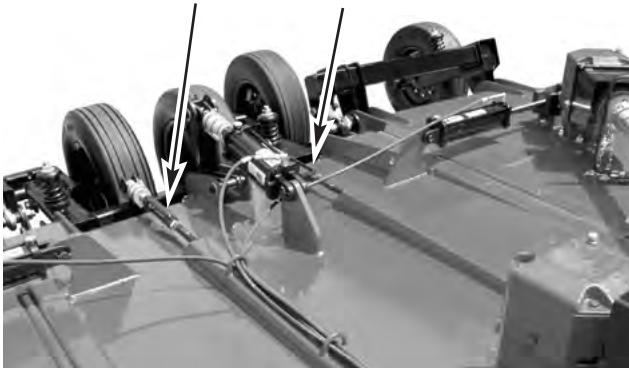
⚠ CAUTION

FAILURE TO MATCH VALVE TO TRACTOR HYDRAULIC SYSTEM BY USING INCORRECT PLUG WILL CAUSE DAMAGE TO TRACTOR.

2-3 PITCH ADJUSTMENT

The pitch of the cutter (front to rear) is controlled by adjusting the linkage rods (Figure 2-4). **Shortening the linkage rod assemblies will raise the front of the cutter. Lengthening the linkage rod assemblies will lower the front of the cutter.** The pitch adjustment is primarily for compensating for the different height of tractor drawbar. As described in the following, it can also be used to alter the cutting performance. Note that operating the cutter at any pitch other than parallel to the ground will produce a slightly uneven cut.

Figure 2-4 Linkage Rod Adjustment Turnbuckles



If you are cutting in dense material, operating cutter with the rear slightly higher than the front will allow an increased volume of cut material to exit from underneath cutter. This will decrease the cutter horsepower requirements.

⚠ WARNING

TO AVOID SERIOUS INJURY OR DEATH: OPERATING CUTTER WITH REAR LOWERED EXCESSIVELY WILL RESULT IN AN UNEVEN CUT AND COULD CAUSE RAPID BLADE, SKID AND DRIVELINE WEAR AND POSSIBLY CAUSE STRUCTURAL FAILURES IN THE WING HINGE AREA.

⚠ WARNING

TO AVOID SERIOUS INJURY OR DEATH: DO NOT PLACE HANDS, FEET OR OTHER PARTS OF THE BODY UNDER CUTTER WHILE MAKING ADJUSTMENTS. NEVER MAKE ADJUSTMENTS WITH CUTTER OPERATING.

IMPORTANT
NEVER ADJUST THE TURNBUCKLE SO THAT THE THREADED END OF ANY ROD IS NOT FULLY ENGAGED IN THE TURNBUCKLE.

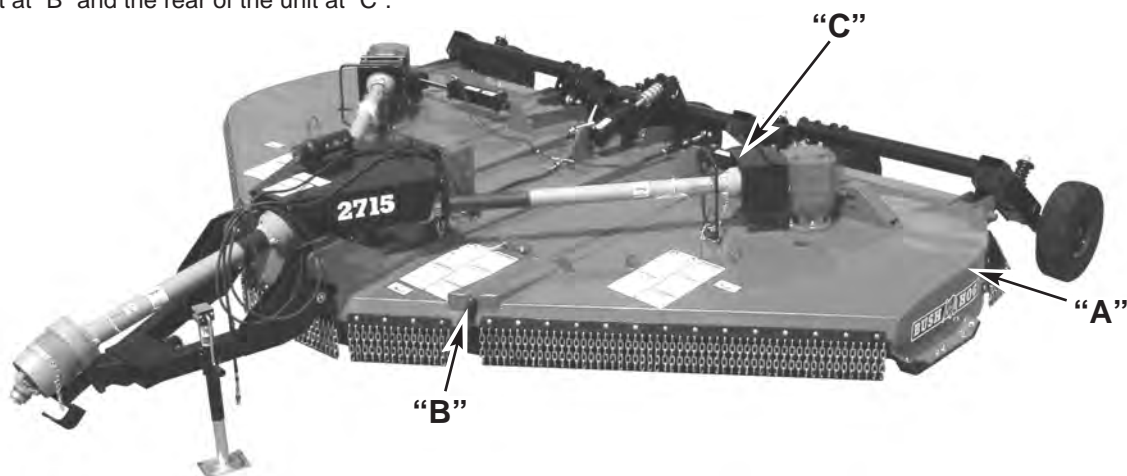
LEVELING THE CUTTER

To check the attitude of the unit for side to side level and front to rear level, the following locations should be used:

Place cutter on a flat area with the wings unfolded and the wing cylinder control valve in float position.

To check the front to rear levelness, measure from the top of the center section hinge tube to the ground at the front of the unit at "B" and the rear of the unit at "C".

The wings should be adjusted before use. To check the wings for levelness, measure from the top of the center unit hinge tube ("B" & "C") to the ground at the front and rear of the unit. Measure from the flat (horizontal) area extending from the gearbox to the side band at "A" to the ground. This dimension should be between the measurements taken at the center section hinge tube. Repeat for both wing sections. Measurements taken at "A" for both wings should be the same.



Adjust the pitch as follows:

A. Loosen jam nut on each linkage rod assembly. (Figure 2-3).

B. Use the turnbuckles to lengthen or shorten the leveling rod assemblies. Shortening the rods will raise the front of the cutter and lengthening rods will lower the front of the cutter. While adjusting, alternate from one rod to the other.

C. **When the desired pitch is attained, make a final adjustment of the rods so that each will be under the same amount of tension. This may be done by tapping the rods and “tuning” them to the same sound.**

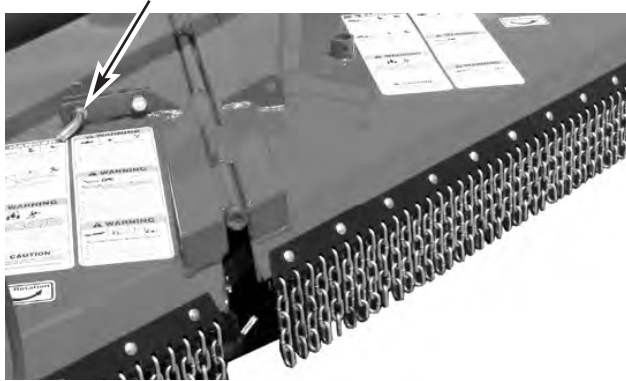
D. Re-tighten jamnut.

2-4 WING ADJUSTMENT

Wings should be adjusted before use if they are not level (parallel) left to right with center deck section. Adjust as follows:

A. Lower cutter until skids on center section are approximately 1-2 inches (25-51mm) off ground.

Figure 2-5 Wing Transport Lock pin Stored for Work



WARNING

TO AVOID SERIOUS INJURY OR DEATH: STAND CLEAR OF WING(S) DURING AND AFTER REMOVAL OF TRANSPORT LOCK PIN(S). AIR IN HYDRAULIC COMPONENTS MAY ALLOW WING(S) TO FALL. DO NOT “DRIVE OUT” PIN IF IT IS TIGHT AGAINST WING LUG. TO REMOVE PIN, RETRACT WING LIFT CYLINDER TO RELIEVE LOAD ON PIN.

B. Remove wing transport lock pin(s) and place in link and flip pin onto deck of center unit for storage.

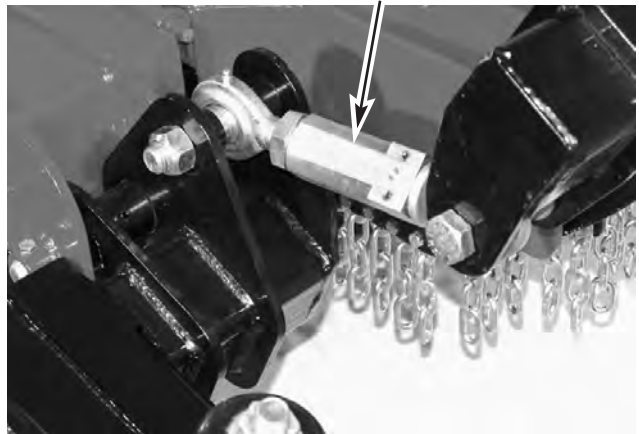
C. Lower wing(s) to ground allowing weight to rest on wheel(s).

D. If wing(s) are not level (parallel to center section), back jamnut off and **adjust turnbuckle shorter to lower the outside edge of the wing and longer to raise the outside edge of the wing.** It may be necessary to use wing lift cylinder to relieve pressure from the turnbuckle during adjustment.

E. Tighten jamnut to 250 ft. lbs. while holding the body of the turnbuckle from turning (Figure 2-6).

Figure 2-6

Adjustable Link



3-5 WING TRANSPORT ADJUSTMENT

A. Fold the wings to the transport position

B. Remove pin from the transport latch and pin the latch to the wing transport lug.

C. If the pin will not install with the wing **fully folded**, the rod end clevis on the wing fold cylinder can be adjusted by loosening the clamp bolt and shortening to make the wing draw up further or loosened to relax the wing so pin can be installed and removed without force.

NOTE

Prior to engaging PTO drive, all gearboxes should have the proper level of gear oil and all lubrication points should be serviced according to the “Maintenance Section.”

SECTION III OPERATING INSTRUCTIONS

3-1 GENERAL SAFETY

Only qualified people should operate this machine. Operator should wear hard hat, safety glasses, and safety shoes. Use ROPS (Rollover Protective Structure) and seat belt equipped tractors for mowing operations. Before beginning operation, clear work area of objects that may be picked up and thrown. Check for ditches, stumps, holes or other obstacles that could upset tractor or damage cutter. Always turn off tractor engine, set parking brake, and allow cutter blades to come to a complete stop before dismounting tractor.

3-2 TRANSPORTING

When implement is transported on road or highway, day or night, use tractor flashing warning lights unless prohibited by law. A slow moving vehicle (SMV) sign must be visible from the rear by approaching vehicles. A bracket for SMV sign is provided on the center section axle. **Do not exceed 15 mph (24 kph) when traveling.** Prepare machine for transporting as follows:

- A. Disengage tractor PTO.
- B. Raise cutter and install stop collars on height adjustment cylinder. Install transport lock.
- C. Raise wing(s) and insert transport lock pin(s).

3-3 OPERATION

- A. Perform BEFORE EACH USE maintenance listed in paragraph 4-1.
- B. Make certain jackstand is stored for work. (Fig. 2-2)
- C. Start tractor. Raise cutter and remove stop collars and transport lock. Remove wing transport lock pins and place in storage hole (Figure 2-5). Lower wings to working position. Raise/lower cutter to working height. The cutter should be operated at the highest position that will give desired cutting results. This will help prevent the blades from striking the ground, reducing blade wear and undue strain on the whole machine. continuous ground and blade contact could force blades into deck area.
- D. Install stop collars to stop cylinder at cutting height. Store remaining stop collars (if any) around self-leveling linkage rod.
- E. With tractor at idle speed, engage PTO drive.

IMPORTANT

DURING OPERATION, THE HYDRAULIC VALVE WING LEVERS MUST BE LOCKED IN THE FLOAT POSITION TO AVOID DAMAGE TO THE CYLINDERS AND AXLES.



WARNING

TO AVOID SERIOUS INJURY OR DEATH: IT IS HAZARDOUS TO OPERATE UNIT WITH WINGS RAISED ABOVE GROUND.



WARNING

TO AVOID SERIOUS INJURY OR DEATH: KEEP CLEAR OF MACHINE WHEN RAISING OR LOWERING WINGS. DO NOT "DRIVE OUT" TRANSPORT LOCK PIN IF IT IS TIGHT AGAINST WING LUG. TO REMOVE PIN, RETRACT WING LIFT CYLINDER TO RELIEVE LOAD ON PIN.



DANGER

STAY CLEAR OF ROTATING DRIVELINES. DO NOT OPERATE WITHOUT DRIVELINE SHIELDS IN PLACE AND IN GOOD CONDITION. FAILURE TO HEED THESE WARNINGS MAY RESULT IN PERSONAL INJURY OR DEATH.



DANGER

ROTARY CUTTER BLADES. STAND WELL CLEAR UNTIL ALL MOTION HAS STOPPED. TO AVOID AN ACCIDENTAL FALL FROM TRACTOR AND POSSIBLE INJURY OR DEATH BY MOWER, IT IS RECOMMENDED THAT TRACTOR BE EQUIPPED WITH ROLLOVER PROTECTIVE SYSTEM (ROPS) AND A SEAT BELT BE USED BY THE OPERATOR FOR ALL MOWING OPERATIONS.

F. Place tractor in gear and proceed forward. Advance tractor throttle to correct PTO speed for implement (540 or 1000 RPM). Tractor forward speed should be controlled by gear selection, not engine speed. **For maximum cutting efficiency, forward speed should allow cutter to maintain a constant, maximum blade speed.** Failure to maintain proper blade RPM will result in poor cutting performance and excessive blade and blade bolt wear. If PTO drive is disengaged due to cutter stalling or tractor engine bogging, cutter must be raised to maximum cutting height and tractor throttle reduced to idle before re-engaging. Rear deck bands can be installed when extra mulching of foliage is desired. When in areas with tall, dense material, the front skids may push material over and hold it down long enough to prevent blades from cutting it. This will be evidenced by streaking in the skid area. To alleviate this problem, remove the front skids.

IMPORTANT

DURING OPERATION, STOP AT REGULAR INTERVALS AND CLEAN ACCUMULATED DEBRIS FROM THE TOP OF CUTTER DECK, ESPECIALLY AROUND DRIVELINES AND GEARBOXES. THIS WILL HELP PREVENT MATERIAL FROM CATCHING FIRE.



WARNING

ALL ROTARY CUTTERS HAVE THE ABILITY TO DISCHARGE OBJECTS AT HIGH SPEEDS WHICH COULD RESULT IN SERIOUS INJURY TO BYSTANDERS OR PASSERS-BY. DO NOT OPERATE CUTTER ALONG ROADWAYS OR IN THE VICINITY OF OTHER PERSONS WITHOUT ENCLOSED SIDES, PERMANENT BANDS, BELTING, HIGHWAY CHAINS OR OTHER FACTORY APPROVED DISCHARGE SHIELDS IN PLACE AND IN GOOD WORKING ORDER.

Refer to additional Key Operation Points on page 8

SECTION IV MAINTENANCE

4-1 MAINTENANCE CHECK LIST

Perform scheduled maintenance as outlined below. Lower machine to ground, turn off tractor and set parking brake before doing maintenance inspections

or work. Some checks may require raising machine off ground and supporting with blocks. All bolts should be torqued as recommended in Torque Chart unless otherwise indicated.



WARNING

THE CUTTER CAN FALL FROM HYDRAULIC SYSTEM FAILURE. TO AVOID SERIOUS INJURY OR DEATH, SECURELY SUPPORT CUTTER BEFORE WORKING UNDERNEATH.

BEFORE EACH USE

1. Make certain driveline shields are in place and in good repair to minimize entanglement injuries to persons by rotating drivelines.
2. Make certain deflector shields (chains, bands, etc.) are in good repair to minimize injuries to persons by the discharge of high speed thrown objects.
3. Inspect blades for wear. Replace if necessary per paragraph 4-3. **Always replace both blades on spindle with two blades equal in weight. Use only genuine Bush Hog replacement blades.**
4. Check blade bolts for tightness. **Tighten (dry unlubed bolt) to 600ft./lbs. (812 Nm).**
5. Check blades and spindles to be sure that no foreign objects such as wire or steel strapping bands are wrapped around them.
6. Inspect hydraulic lines and fittings for wear or leaks. Repair or replace if needed.



WARNING

USE A PIECE OF CARDBOARD OR WOOD RATHER THAN HANDS AND WEAR EYE PROTECTION WHEN SEARCHING FOR HYDRAULIC LEAKS. ESCAPING HYDRAULIC OIL UNDER PRESSURE CAN PENETRATE THE SKIN. IF OIL IS INJECTED INTO THE SKIN, IT MUST BE SURGICALLY REMOVED WITHIN A FEW HOURS BY A DOCTOR OR GANGRENE MAY RESULT.

7. Inspect wheel(s) for wear, damage or foreign objects. Repair or replace if necessary.
8. Check tractor tire air pressure. Refer to tractor operator's manual.
9. Perform BEFORE EACH USE lubrication per paragraph 4-2.
10. During operation, listen for abnormal sounds which might indicate loose parts, damaged bearings or other damage.
11. **Check tapered pin retaining each end of each driveline for tightness. Tighten nut to 30 ft./lbs. Use only genuine Bush Hog replacement parts.**

AFTER EACH USE

1. Clean all debris from machine especially underside of deck and affixed safety decals. Replace any missing or illegible decals.
2. Inspect cutter for worn or damaged components. Repair or replace before next use. Any replacement components installed during repair shall

include the components current safety decals specified by the manufacturer to be affixed to the component.

3. Store cutter in a dry place.

4-2 LUBRICATION (Figure 4-1)

NOTE:

The multi-purpose grease referenced in this section is an NLGI Grade 2 type grease.

Input Driveline - Machine must be lowered to ground before lubrication so holes in shield will align.

BEFORE EACH USE

NOTE:

All drivelines are designed to have the grease fittings on any driveline to all be accessible once one fitting is positioned for serviceability. The shields must be rotated to expose the fittings once the driveline is positioned.

If care is taken during the initial assembly of the cutter and all drivelines are assembled so the fittings on all drivelines are pointed up, rotating the input driveline from one to five times will reposition all driveline fittings so they are accessible.

1. Driveline Universal Joints - Apply 2-3 shots of multi-purpose grease with grease gun.
2. Driveline Guard - Apply 2-3 shots of multi-purpose grease with grease gun to plastic fitting.
3. **Constant Velocity (CV) Joint - Position CV joint as straight as possible to be sure grease will penetrate to ball joint. Lubricate the central body with a minimum of 30 shots of grease every 8 hours. Lubricate telescoping**

members with 10 shots every 8 hours and clean telescoping members every 40 hours and completely coat with grease.

4. Axle Pivot and Self Leveling Hitch - Apply 2-3 shots of multi-purpose grease with grease gun.
5. **Driveline - Apply 3-4 shots multi-purpose grease to grease fitting accessible on outer shield half.**
6. Axle Arm Pivot Pins - Apply multi-purpose grease with grease gun.
7. **Gearboxes - Add EP80W-90 oil, if necessary, to bring oil level to check plug located on side of housing. Capacity of transfer gearbox is 2.75 quarts (2.6L). Blade gearbox capacity is 6 quarts (5.7L).**

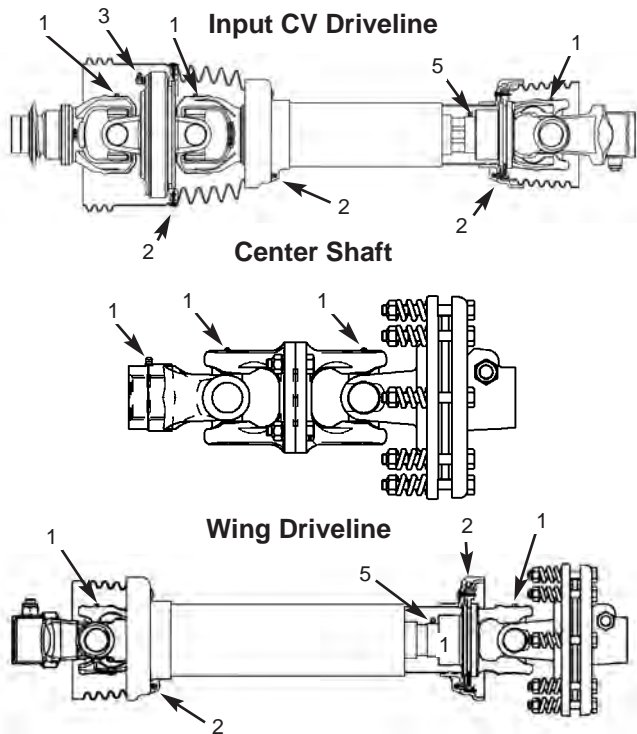
40 HOURS

8. Wing Turnbuckles - Apply multi-purpose grease slowly with grease gun.

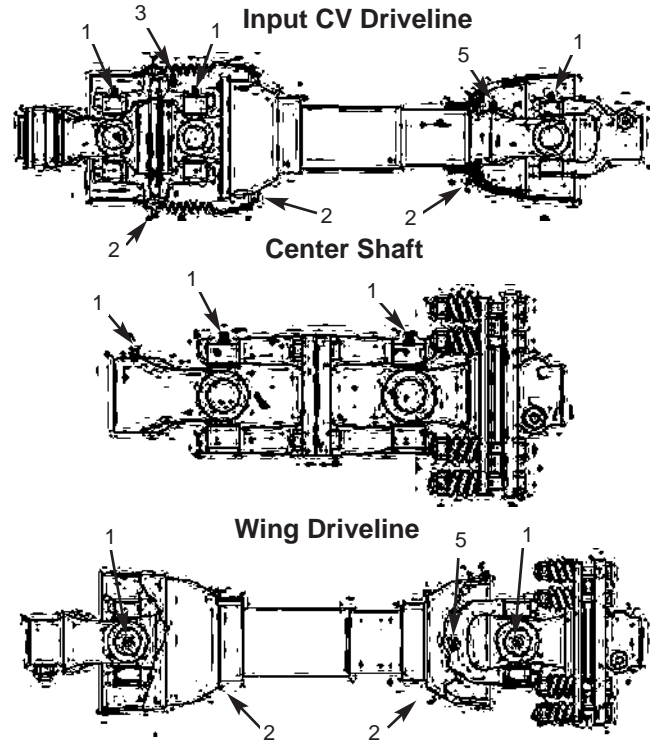
120 HOURS

9. Wheel Bearings - Apply multi-purpose grease slowly with grease gun until grease relieves around seal.

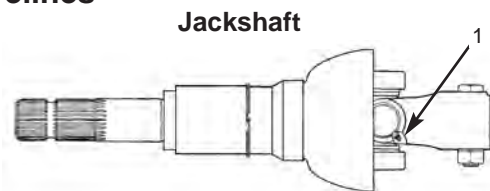
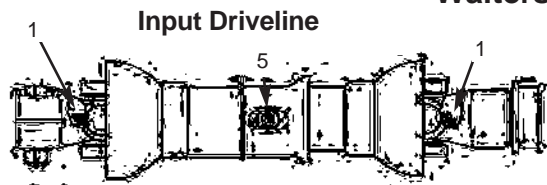
Bondioli & Pavesi Drivelines



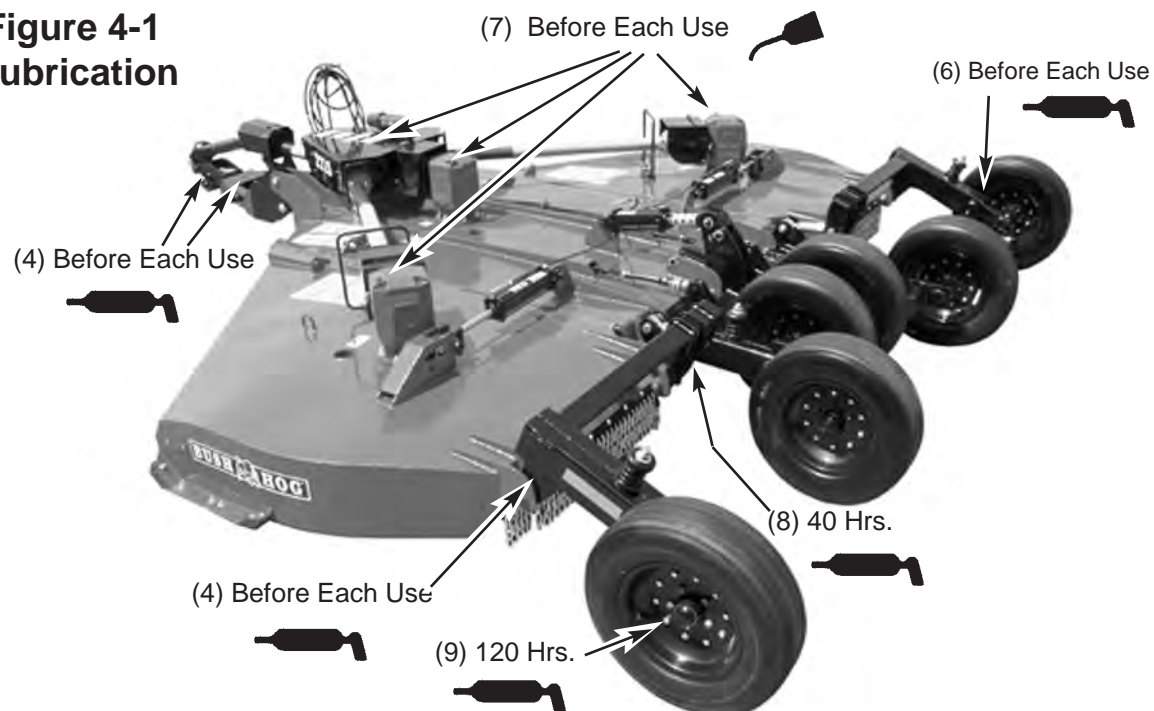
Comer Drivelines



Walterscheid Drivelines



**Figure 4-1
Lubrication**

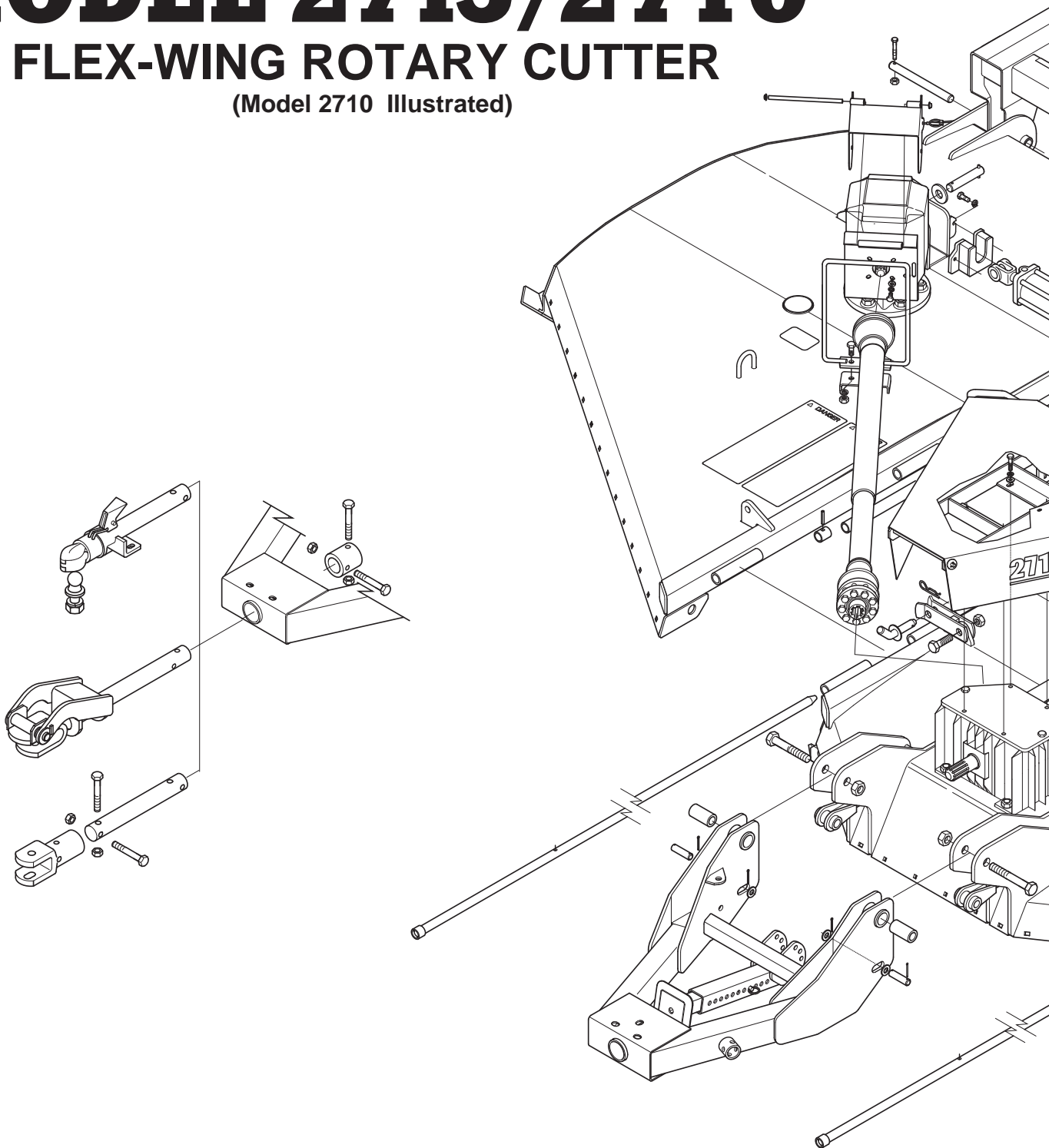


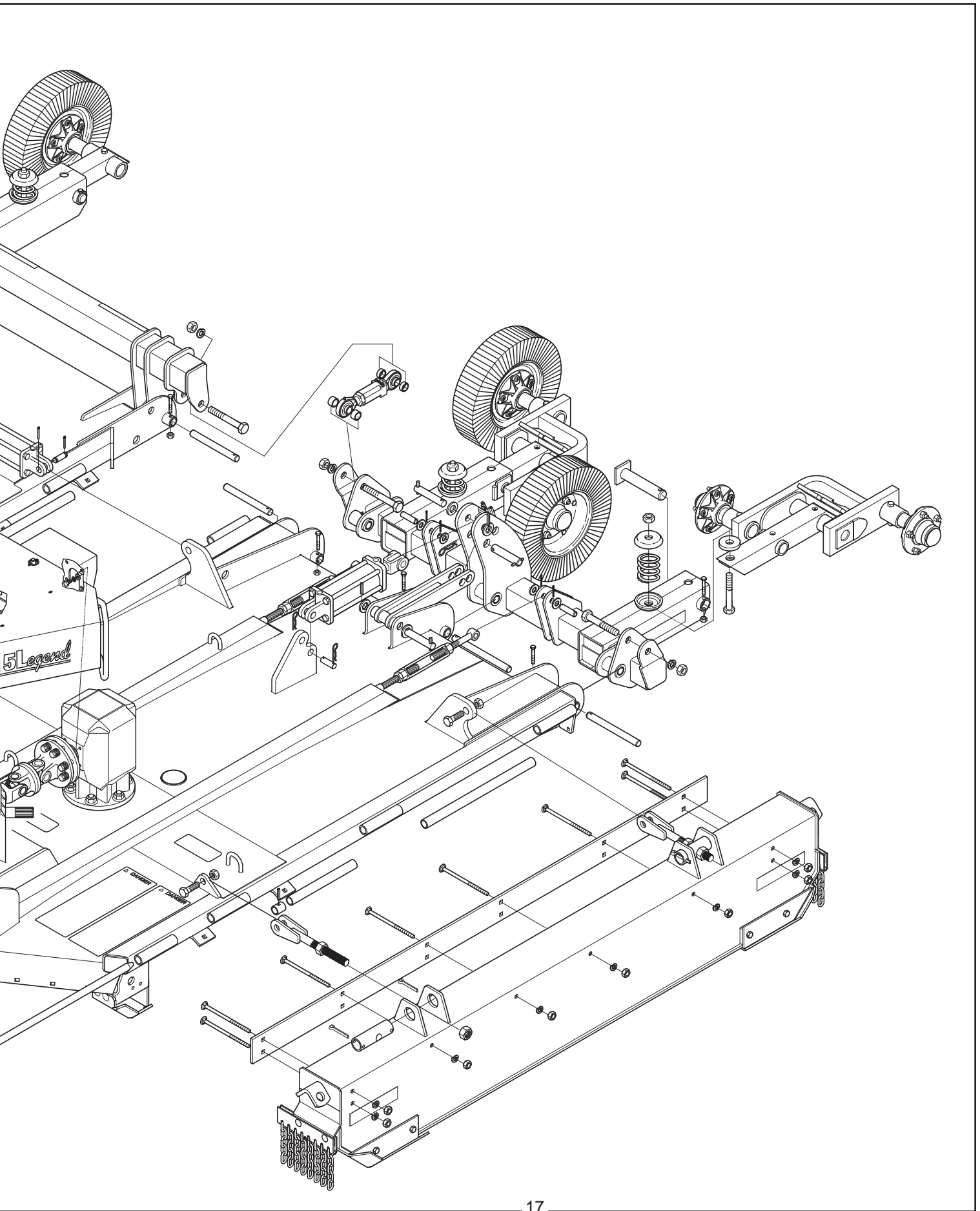
BUSH HOG®

MODEL 2715/2710

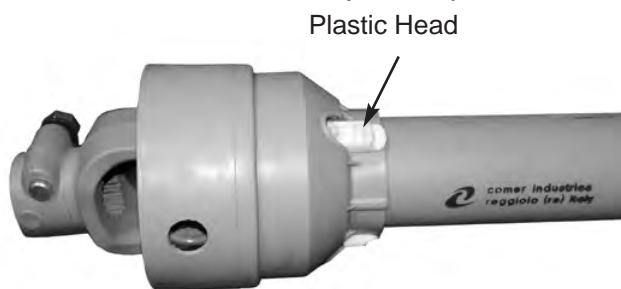
FLEX-WING ROTARY CUTTER

(Model 2710 Illustrated)

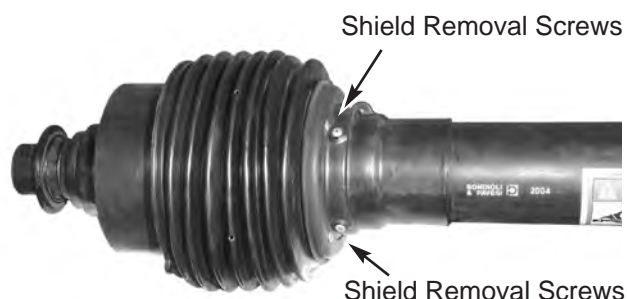




To Remove Yoke Shield From EG/Comer Driveline: Using a screwdriver, turn the plastic head 90° counter-clockwise and slide shield away from U-joint.



To Remove Yoke Shield From Bondioli & Pavesi Driveline: Remove the four screws from the rear side of the shield and slide shield away from U-joint.



4-3 BLADE REPLACEMENT

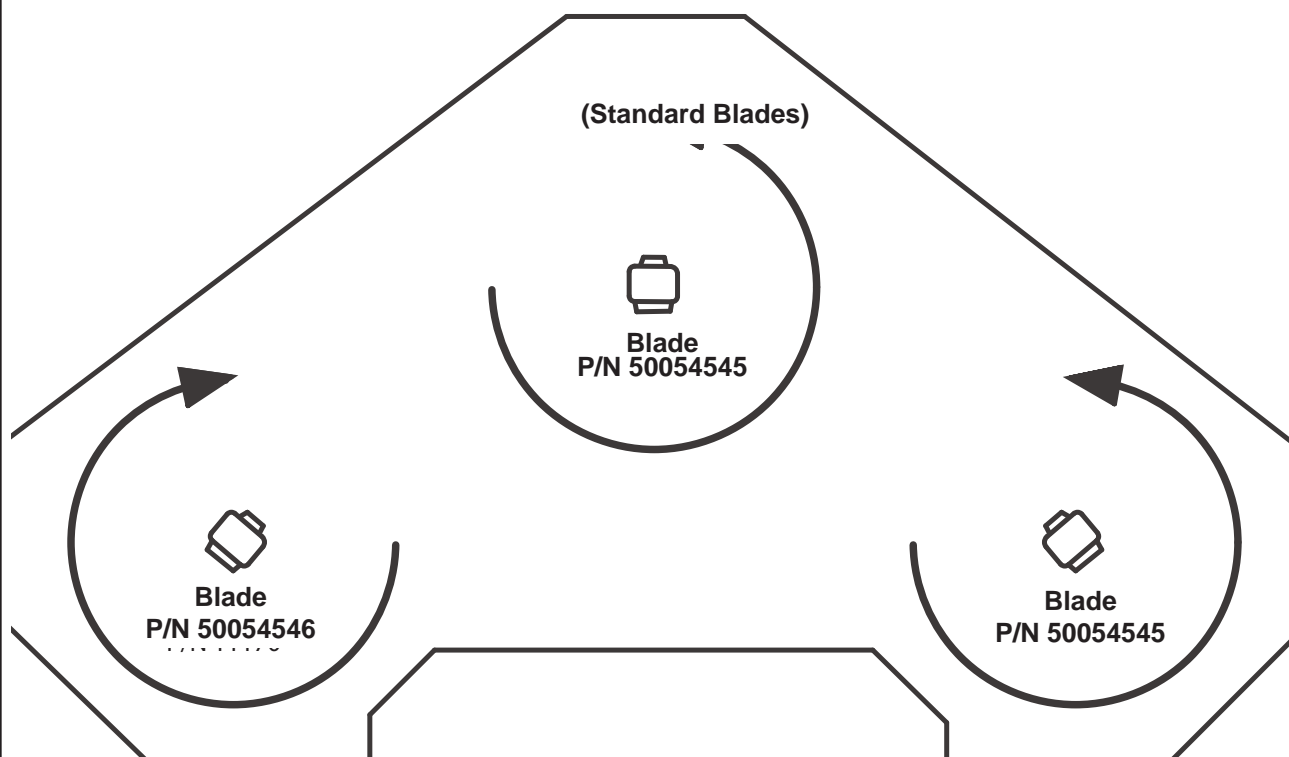
It is not necessary to remove the complete blade holder assembly to replace the blades.* Blade bolts are accessible through a hole in the top of the cutter deck. Always replace both blades on a spindle using two blades having the same weight. Use only genuine Bush Hog replacement blades.

- A. Remove nuts from blade bolts.
- B. Inspect blade bolt shoulder for wear. Replace if necessary.

C. Assemble new blades to blade holder using blade bolts, nuts and lockwashers. **Refer to BLADE ROTATION DIAGRAM for blade placement. Tighten nuts (dry, unlubed bolts) to 600 ft./lbs. Strike blade bolt head with heavy hammer to seat, then retighten.**

D. Check to be sure blades swing 360 degrees freely. If blades will not swing freely, remove, locate problem, and repair. Operating cutter when blades will not swing freely will cause excessive vibration, damaging implement.

BLADE ROTATION DIAGRAM



*NOTE:

If the round blade holder is removed from the gearbox output shaft for any reason, it must be reassembled with the slotted nut **torqued to a minimum of 450 ft. lbs.** If 450 ft. lbs. is reached and slots in the nut do not align with the hole through the output shaft, tighten slightly more so that cotter pin may be installed. Do not "back off" on the nut to align slots with hole.

4-4 SLIP CLUTCH OPERATIONAL CHECK

After implement has been stored for 30 days or more, perform the following operational check:

A. Loosen eight nuts retaining clutch springs 1/3 turn or until spring can be turned with fingers.

B. With tractor at idle speed, engage tractor PTO drive for 2-3 seconds. Clutch should slip without turning blades. If clutch does not slip, contact your authorized Bush Hog dealer.

C. Retighten nuts to within 1/64" of original position. Initial spring length is shown in Figure 4-2.

IMPORTANT
FAILURE TO RETIGHTEN NUTS TO ORIGINAL POSITION MAY CAUSE DAMAGE TO IMPLEMENT AND/OR TRACTOR DUE TO IMPROPER SLIP CLUTCH TORQUE SETTING.

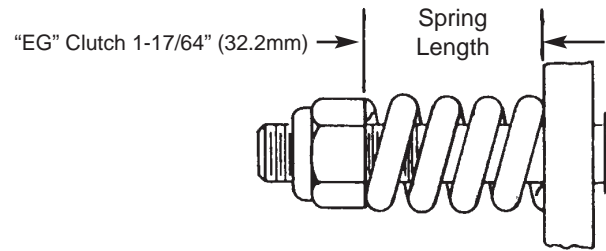
4-5 SLIP CLUTCH ADJUSTMENT

The slip clutch is factory preset to the correct torque for protecting implement and tractor. **Periodic adjustment is recommend**; refer to section 4-4. Should adjustment be needed, first check to be sure all spring lengths are the same. Initial spring lengths are shown in Figure 4-2. If necessary, adjust nut on any spring that is unequal. Adjust all eight spring retaining nuts 1/3 of a turn (2 flats on a nut) and check clutch slippage. If further adjustment is necessary, do so in 1/3

turn increments. Adjust only to provide sufficient torque to prevent slippage under normal conditions. Occasional slippage is normal for drivetrain protection. If satisfactory results cannot be obtained consult your Bush Hog dealer.

IMPORTANT
DO NOT OVER-TIGHTEN NUT AND CAUSE SPRING TO BECOME SOLID AS THIS WILL CAUSE SHAFT TO FAIL.

Figure 4-2 Spring Length



4-6 TROUBLESHOOTING

Troubleshooting procedures are listed in Table 4-1. If the problem cannot be solved or replacement parts are necessary, contact your authorized Bush Hog dealer. Please have ready your machine name, model number, serial number, purchase date and exact cause or description of problem.

TABLE 4-1 GENERAL TROUBLESHOOTING

PROBLEM	PROBABLE CAUSE	REMEDY
Uneven cut	Cutter not level side to side or front to rear. Worn or bent blades.	Refer to Section II. Replace blades per paragraph 4-3.
Stripping or windrowing	Possible build up of material under cutter. Cutter not level. Worn blades. Cutter not being operated at rated RPM speed. Front skids holding tall material down.	Clean cutter. Refer to SECTION II. Replace per paragraph 4-3. Set tractor throttle for proper PTO speed during operation. Remove front skids.
Noisy cutter	Loose components. Low oil in gearboxes.	Check all bolts for tightness. Check for proper oil level. Refer to paragraph 4-2.
Rapid blade wear (cutting edge)	Blade contacting the ground.	Adjust cutter to operate at a height that will eliminate ground contact.
Rapid blade wear (bolt hole)	Cutter not being operated at rated RPM speed.	Set tractor throttle for proper PTO speed during operation.
Cutter vibration	Cutter not being operated at rated RPM speed. Blades on same spindle have unequal weight.	Set tractor throttle for proper PTO speed during operation. Replace blades with matched set.
Wings will not raise	Valve plumbed wrong.	Plumb as shown in Figure 5-12. Reverse hoses to tractor auxiliary hydraulic outlets.
Shields failing.	Excess debris accumulation. No grease. Not chained.	Clean debris from cutter. Lubricate shields per paragraph 4-2. Fasten shield chains to stationary location.

SECTION V ASSEMBLY

CAUTION

THE FOLLOWING SAFETY PRECAUTIONS SHOULD BE THOROUGHLY UNDERSTOOD BEFORE ATTEMPTING MACHINE ASSEMBLY.

1. Wear personal protective equipment such as, but not limited to protection for eyes, ears, feet, hands, lungs and head when assembling the equipment. Do not wear loose clothing or jewelry that may catch on equipment moving parts.
2. Do not lift heavy parts or assemblies. Use crane, jack, tackle, fork trucks or other mechanical devices.
3. Select an area for assembly that is clean and free of any debris which might cause persons working on the assembly to trip.
4. Arrange parts to be assembled neatly in the work area and have tools or other mechanical assisting devices in easy reach.
5. Inspect all parts and assemblies thoroughly and remove any sharp edges, grease, oil or dirt which might cause pieces to slip when handling.
6. Preview the assembly instructions in your operator's manual before proceeding further.
7. If the assembly instructions call for parts or assemblies to be blocked up, use only blocking material that is in good condition and is capable of handling the weight of the assembly to be blocked. Also, insure that the blocking material is on a clean, dry surface.
8. Never put hands or any other part of body under blocked up assemblies if at all possible.
9. Always wear goggles or safety glasses when hammering, grinding, or drilling metal parts.
10. If the assembly calls for welding or cutting, be sure that there are no flammable materials close at hand and that bystanders have taken necessary precautions.

AFTER COMPLETING ANY ASSEMBLY STEP, THOROUGHLY READ THE NEXT STEP IN THE ASSEMBLY INSTRUCTIONS BEFORE PROCEEDING WITH THAT STEP.

11. After completing assembly, thoroughly inspect the machine to be sure that all nuts, bolts, hydraulic fittings or any other fastened assemblies have been thoroughly tightened.
12. After completing assembly, be sure that all safety locking devices or guards are in place.
13. Before operating the machine, thoroughly read the operation section of this manual.
14. Before operating the machine, read the maintenance section of this manual to be sure that any parts requiring lubrication such as gearboxes are full to avoid any possible damage.

BEFORE OPERATING THE EQUIPMENT, IF YOU HAVE ANY QUESTIONS REGARDING THE PROPER ASSEMBLY OR OPERATION, CONTACT YOUR AUTHORIZED BUSH HOG DEALER OR REPRESENTATIVE.

5-1 MODEL 2715 ASSEMBLY NOTE

Overall machine assembly illustration is located on pages 16 - 17.

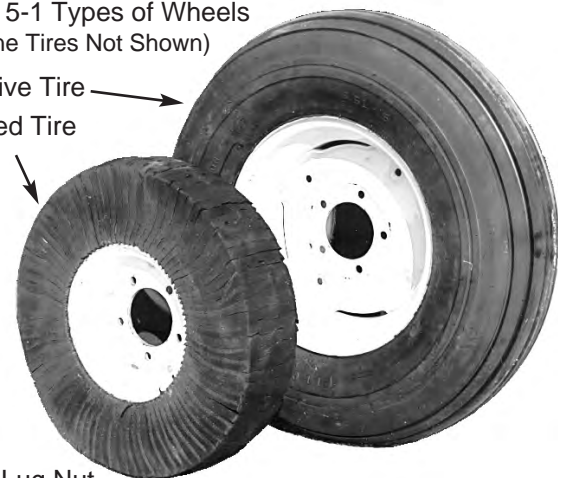
A. Four types of wheels are available for this machine, requiring the hydraulic cylinder to be mounted in different locations on the deck lug. (Figure 5-2). The four type wheels are: Laminated Tire, Automotive Tire, Aircraft Tire (29 x 9.0 - 15) and Filled Aircraft Tire (24 x 7.7 - 10). With the larger aircraft tire or automotive tire, the cylinder mounts in the top hole. With the filled aircraft tire or laminated tire, the cylinder mounts in the lower hole.

NOTE

When using laminated tires or airplane tires, the flat side of the lug nut should be against the rim. When using automotive rims, the tapered side of the lug nut should be against the rim.

Figure 5-1 Types of Wheels
(Airplane Tires Not Shown)

Automotive Tire →
Laminated Tire →



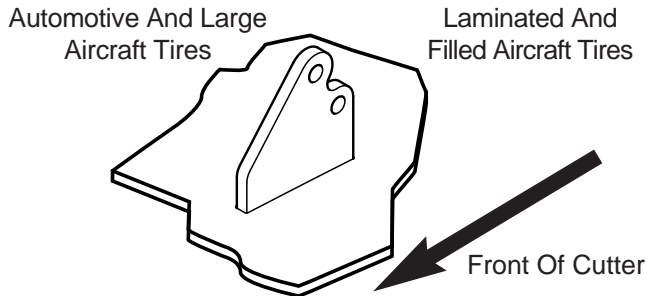
Lug Nut

Flat Side →



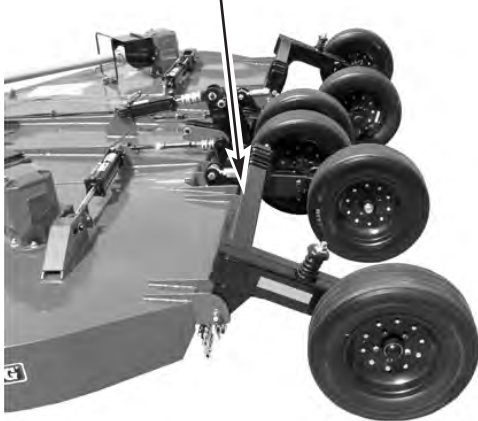
← Tapered Side

Figure 5-2 Axle Cylinder Mounting Holes



B. When installing the axle arms on the center section, the longer spindle should be to the outside (hinge side) providing a wider wheel base. The longer spindle can be installed to either side when dual wheels are installed on the wing, but it is preferred to have the longer spindle to the inside.

Figure 5-3 Wing Axle Assembly



C. There are three styles of axle arms available on the 2715. Only the dual wheel and the tandem axle arms are to be used in the center section. Only single and dual axle arms are to be used on the wings. Install the axle arm to the axle arm mounting bracket on the axle weldments using one rubber washer, spring, spring retainers, 1" x 7-1/2" bolt and 1" locknut. Install pivot pin through axle mounting bracket and axle arm. Be sure that square head of pin rests against stop on side of axle arm mounting bracket. Align 3/8" bolt hole in pivot pin with hole in retainer bushing and install bolt and lock nut to retain pivot pin. Tighten 1" locknut until outside dimension between spring retainers is 5". (Figure 5-4)

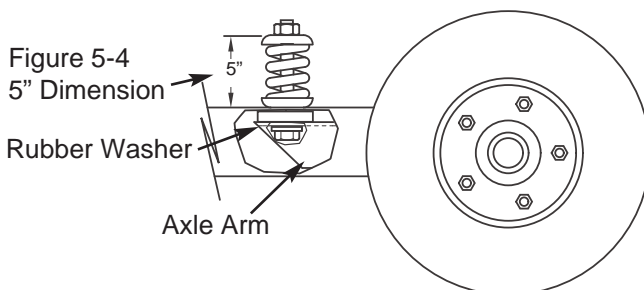


Figure 5-4
5" Dimension

Rubber Washer
Axle Arm

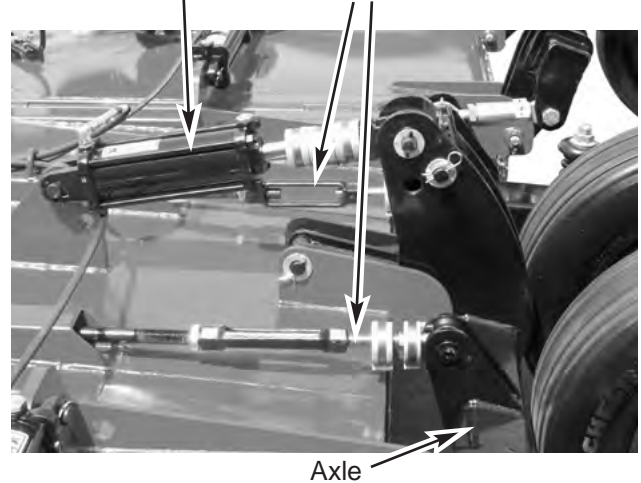
E. If the wing sections are equipped with single wheel option, the wheel should be assembled to the outside of the axle arms.

F. Bolt tongue to center section using two 1" x 8-1/2" bolts, locknuts and bushings.

G. Fasten linkage rods to the holes in the tongue side plates using 1" x 5" pins, two 1" flatwashers and roll pins.

H. Attach turnbuckle end of linkage rods to axle using pins and cotter pins. (Figure 5-5)

Figure 5-5 Cylinder Linkage Rods & Turnbuckles



I. There are three types of drawbar attachments available for the Model 2715L, a cast iron non-flex clevis, a 2" ball hitch or a heavy duty, Perma Level self-leveling clevis.

Cast Clevis - Remove large clevis pin from clevis and slide pin into tongue with slotted hole to the bottom side. Secure with two 5/8" x 6" bolts, lockwashers and nuts. (Figure 5-6)

2" Ball Hitch - Install ball hitch weldment into tongue. Install 5/8" x 6" bolts through "L" bracket on ball hitch weldment and tongue top and bottom plates, securing with flatwashers, lockwashers and nuts. Install clevis pin collar over end of pin and secure with 5/8" x 3-3/4" bolts and locknuts. (Figure 5-7).

Perma Level Hitch - Remove collar from clevis pin and slide pin into tongue with the clevis on the bottom and clevis pivot pin on the top. Replace the collar onto the back of the pin and secure with the hardware provided. (Figure 5-8)

Figure 5-6
Cast Clevis

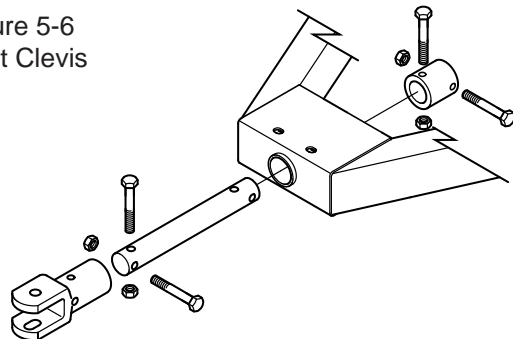


Figure 5-7
Ball Hitch

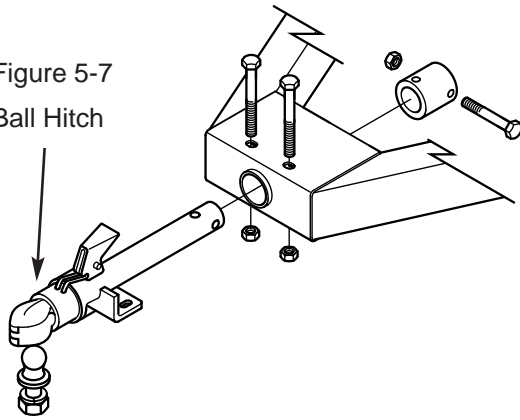
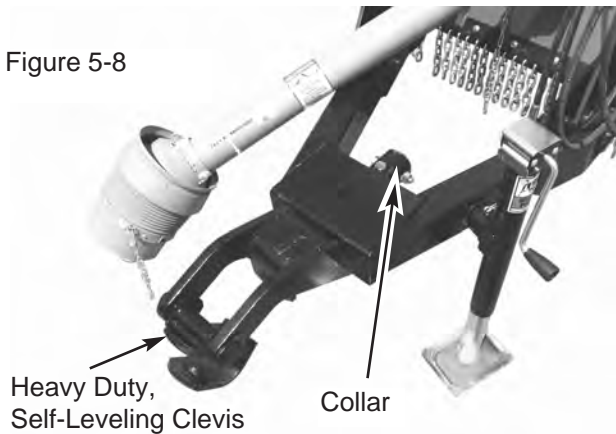


Figure 5-8



J. Connect height adjusting cylinder from cutter deck to axle. Secure the cylinder to the axle using 5-3/8" pin and cotter pin. (Figure 5-5)

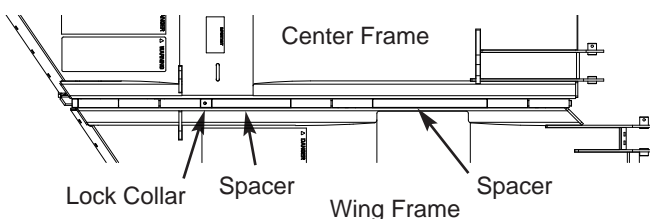
K. Attach hose holder rod to tongue using 5/8" x 2" bolt, nut, flatwasher and lockwasher. Flatwasher is installed on top and lockwasher on bottom.

L. Lift wing using a chain hoist or fork lift and position so the hinge tubes on the wings engage the hinge tubes on the center section with the front edge of the cutter lined up. Install hinge pin through the hinges. (Figure 5-9)

NOTE: The hinge pin will install easier if a 1" rod is temporarily inserted in the last two hinge tubes once the pin is started in the front hinge.

Install hinge shields between hinges as pin is inserted. Be sure to install the hinge pin lock collar after first set of hinge tubes. Secure hinge pin with lock collar and roll pin. Repeat this step for both wings.

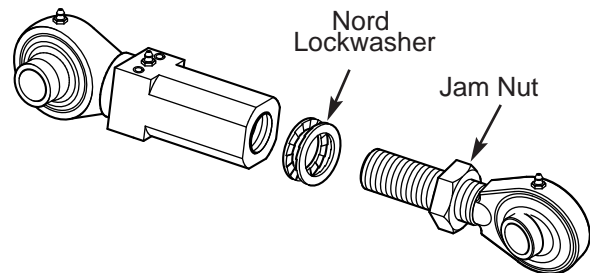
Figure 5-9



M. Place a 2-4 inch block under each center section front skid. Raise rear of center section until it is level and install stop collars on height adjustment cylinder to retain in this position.

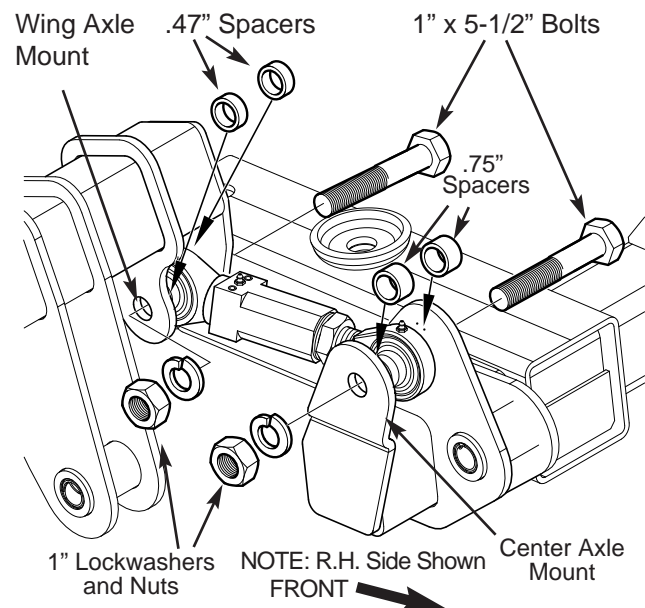
M-1. Install Nord Lockwasher (Two Piece) on turnbuckle by loosening the jam nut on the threaded end and removing the rod end from the turnbuckle. Install Nord lockwasher on the threaded rod end and re-install the rod end into the turnbuckle body, making sure the Nord lockwasher is between the jam nut and the turnbuckle body. (Figure 5-10) Leave the jam nut loose for proper adjustment after it is installed on the axle.

Figure 5-10 Turnbuckle Assembly



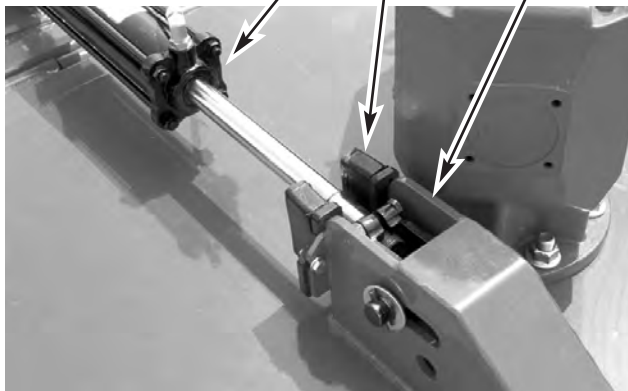
N. Raise wing until it is level right to left with the center section. Install swivel turnbuckle between center axle and wing axle. (Figure 5-11) **To check the attitude of the unit for side to side level and front to rear level refer to page 10, Pitch Adjustment and Leveling The Cutter.** Tighten the 1" x 5-1/2" Grade 5 bolts to 650 ft. lbs. After 8 hours of operation, retighten to 650 ft. lbs. Torque the jam nut on the turnbuckle to 250 ft. lbs. against the turnbuckle body. Loosen and retighten the jam nut to 250 ft. lbs. a second time. Recheck all hardware for proper torque after 8 hours of operation and tighten as necessary.

Figure 5-11



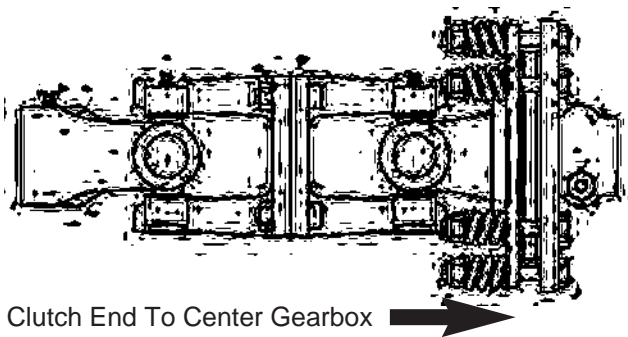
O. Install wing over center stops on each wing lug using 3/8 x 1" bolts and lock washers. Install wing lift cylinders with rod end connected to the wing lug. It may be necessary to remove port plugs to extend cylinder. **Install the cylinder in the slotted holes.** Place a 1-1/4" diameter x 1" long cylinder pin spacer bushing between the ears of the cylinder. Secure cylinder in slot with 5-3/8" pin, flatwashers and cotter pins. **NOTE: A flatwasher is required on both ends of the pin between the roll pin or cotter pin and the slotted cylinder lugs. If this is not done, the pin can work free of the cylinder lug. (Figure 5-11).**

Figure 5-11 Wing Cylinder Stop Wing Lugs



P. Assemble center section driveline as shown in Figure 5-12. The driveline must be disassembled by removing the bolts holding the two halves together. Install clutch end to center section gearbox using tapered pin, lockwasher and nut. Tighten to 30 ft. lbs. Slide yoke end onto power divider gearbox. Reinstall bolts holding the two halves together. Note that the bolts must be installed so that nuts will be on clutch end. Rotate grease fittings to the top for easy access later.

Figure 5-12 Center Driveline Assembly



Q. Attach shield assembly to center gearbox using four 10mm x 25mm bolts, lockwashers and flatwashers. (Figure 5-13) Remove four bolts from power divider gearbox. Attach shield assembly to top of power divider gearbox using four 10mm x 50mm bolts (from bag of fasteners) lockwashers and flatwashers.

Figure 5-13 Center Shield Installation
10mm x 50mm Bolts 10mm x 25mm Bolts

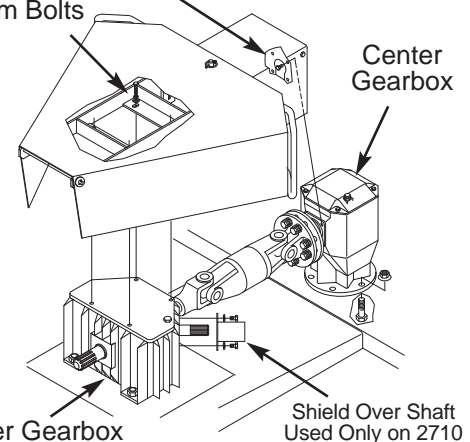


Figure 5-14 Retaining Ring



R. Attach U-joint retaining bracket to the mounting bracket welded to the deck of each wing in front of the gearbox input shaft. Secure with two 1/2" x 1-1/2" bolts, lockwashers and locknuts. (Figure 5-14)

S. Install hinge plate and lock angle on wing gearboxes using four 10mm x 25mm bolts, flatwashers and lockwashers per shield. Install shield on hinge plate using rod and two pushnuts. Lower shield and secure with lynch pin.

T. Install wing drivelines, attaching the clutches to the wing section gearboxes. Rotate the driveline until the grease fittings are on top and in the same position as center unit driveline grease fittings. With grease fittings properly positioned, install driveline to power divider gearbox. Secure drivelines with tapered pin, lockwasher and nut. **Tighten nut to 30 ft. lbs.** Pull on each driveline to make certain it is securely attached.

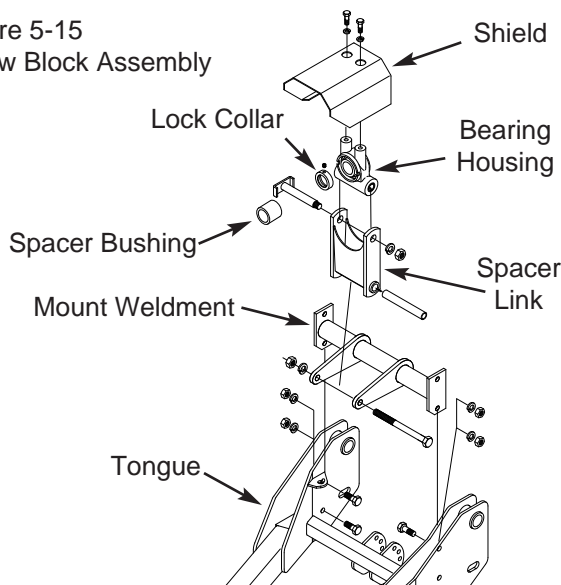
NOTE: If drivelines (including input CD driveline) are installed with the grease fittings in approximately the same position, it will simplify the greasing of all fittings during regular service intervals.

U. If optional pillow block driveline assembly is used, place mount weldment between tongue plates and fasten with 3/4 x 2" bolts, lockwashers and nuts. Slide bearing onto jackshaft until it is against shoulder

of shaft. Slide lock collar up to bearing and turn in the direction of shaft rotation until it slips over the inner ring extension. (Figure 5-16) Turn collar quickly in the direction of shaft rotation (approx. 1/4 turn) to tighten.

V. Align pillow block bearing housing between lugs on spacer link and fasten with pin weldment, lock-washer and nut. (Figure 5-15)

Figure 5-15
Pillow Block Assembly



W. Place punch in blind hole in collar. Strike punch sharply with hammer in the direction of shaft rotation to tighten against inner ring extension. (Figure 5-17) **Tighten setscrew to 20 ft./lbs.**

Figure 5-16

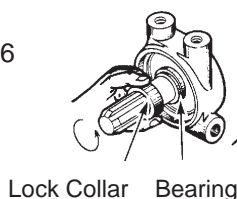
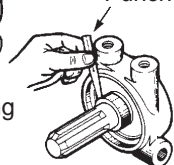


Figure 5-17
Punch



X. Position shield over bearing housing and fasten with 1/2 x 1-1/4" capscrews and lockwashers.

Y. Slide spacer bushing onto end of jackshaft before installing driveline. This will insure proper space will be maintained between the bearing and the driveline yoke.

Z. Plumb hydraulic cylinders as shown in diagrams on pages 28 and 29. **Plugs are supplied to adapt valve for either an open or closed center tractor hydraulic system. Consult your tractor dealer to determine which type system your tractor has.**

IMPORTANT

FAILURE TO MATCH VALVE TO TRACTOR HYDRAULIC SYSTEM BY USING INCORRECT PLUG WILL CAUSE DAMAGE TO TRACTOR.

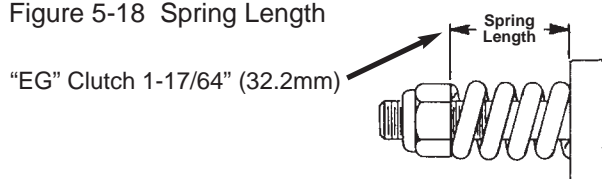
AA. **Fill each gearbox with six quarts (5.7L) of EP80W-90 gearbox oil. Allow time for oil to seep through bearings into lower housing. Replace temporary plugs with permanent plugs supplied in owner's manual package.**

BB. **On each clutch, loosen eight nuts retaining clutch springs 1/3 turn or until spring can be turned with fingers.**

CC. **With tractor at idle speed, engage tractor PTO drive 2-3 seconds. Each clutch should slip without turning blades.**

DD. **Retighten nuts to within 1/64" of original position. Initial spring length is 1-17/64" (32mm).** (Figure 5-18)

Figure 5-18 Spring Length



IMPORTANT

FAILURE TO RETIGHTEN NUTS TO ORIGINAL POSITION MAY CAUSE DAMAGE TO IMPLEMENT AND/OR TRACTOR DUE TO IMPROPER SLIP CLUTCH TORQUE SETTING.

EE. Fold wings into the transport position and install transport lock pins.

5-2 MODEL 2710 ASSEMBLY (Figure 5-19)

NOTE

Overall machine assembly illustration is located on pages 16 - 18.

A. Perform steps "A" through "K" in paragraph 5-1.

B. The front end of the weight box has the top two holes located 2-3/4" from the leading edge. Place the weight box alongside the center section leaving working room between the sections.

C. Fasten the hinge weldment plate to the inside edge of the box using 1/2" x 8" carriage bolts, lockwashers and locknuts. The bolts should be inserted from the hinge side of the weight box.

D. Lift weight box using fork lift or chain hoist and position it in alignment with the center section so that the hinge tubes on the weight box engage the hinge tubes on the center section with the front edge of the cutter and weight box aligned. Install hinge pin through the hinges.

NOTE: The hinge pin will install easier if a 1" rod is temporarily inserted in the last two hinge tubes once the pin is started in the front hinge.

Install hinge shields between hinges as pin is inserted. Be sure to install the hinge pin lock collar after first set of hinge tubes. Secure hinge pin with lock collar and roll pin.

E. Place pivot tube through lugs on weight box.

and fasten with cotter pins on each end.

F. Position connector through the pivot tube using a 1" nut on each side. Leave nuts slightly loose until final positioning.

G. Place the clevis end of the connector over the lugs on the center section and fasten with 7/8" lock-nut. Repeat on opposite end of the weight box. Adjust each connector equally so that the weight box extends straight down and there is 1" clearance between the box and the center section.

IMPORTANT: This clearance must be maintained to prevent blade contact with the box.

H. Attach skids to the front and rear outside edges of the weight box using 1/2" x 8-1/2" bolts, lockwashers and nuts.

I. Fasten front and rear chain sectins to the mounting lips on the ends of the box using 3/8" x 1-1/4" bolts, flatwashers, lockwashers and nuts.

Figure 5-19 Weight Box

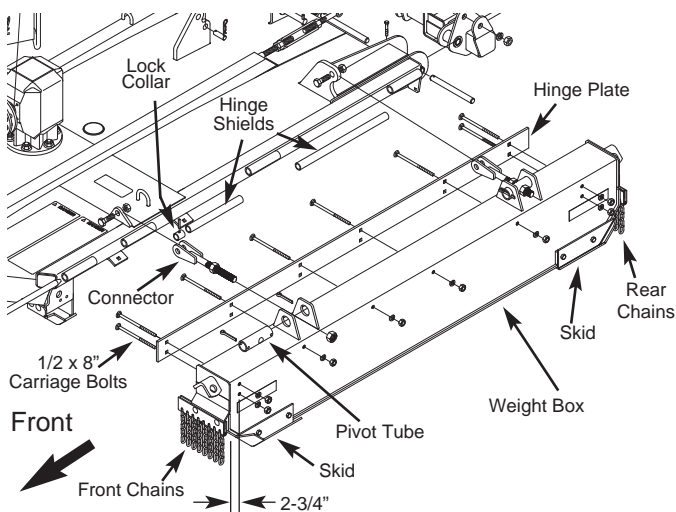
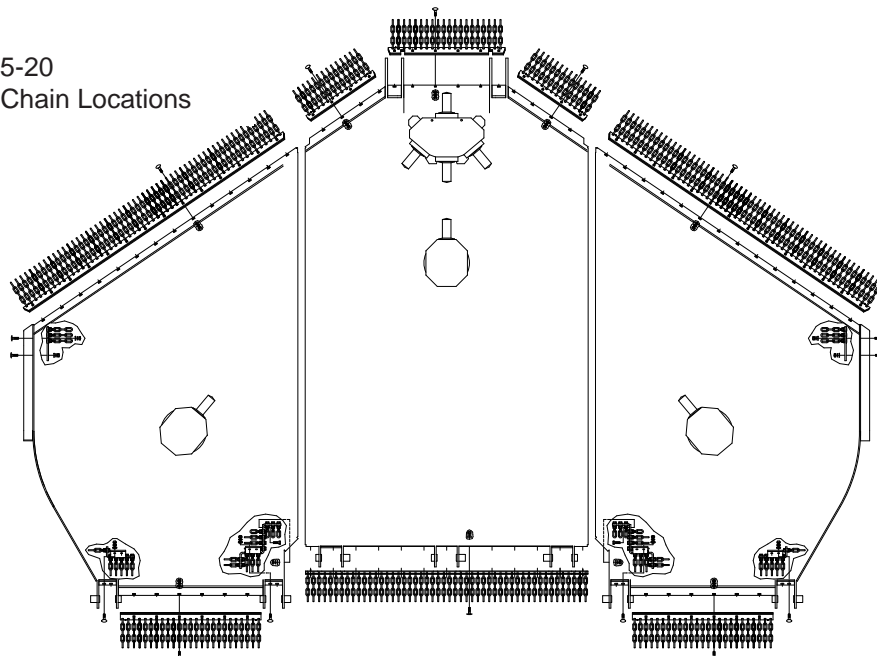


Figure 5-20
Safety Chain Locations



5-3 SAFETY CHAIN INSTALLATION

WARNING

FOR NON-AGRICULTURAL USE, OSHA, ASAE, SAE AND ANSI STANDARDS REQUIRE THE USE OF CHAIN GUARDS OR OTHER PROTECTIVE GUARDS AT ALL TIMES. BUSH HOG STRONGLY RECOMMENDS THE USE OF SUCH GUARDS FOR AGRICULTURAL USES AS WELL, TO REDUCE THE RISK OF PROPERTY DAMAGE, SERIOUS BODILY INJURY, OR EVEN DEATH FROM OBJECTS THROWN OUT BY OR FROM CONTACT WITH THE CUTTING BLADES.

A. Compare each chain assembly to Figure 5-20 to determine location for installation.

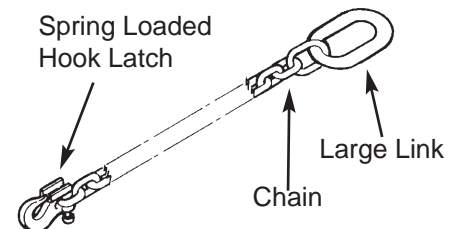
B. Align holes in chain assembly with those on cutter. Insert carriage bolts through chain assembly and deck. Secure with lockwashers and nuts.

C. Tighten all nuts.

SAFETY TOW CHAIN

A. Securely attach tow chain to cutter by looping hook end of chain around one side member of tongue and back through large link on opposite end of chain.

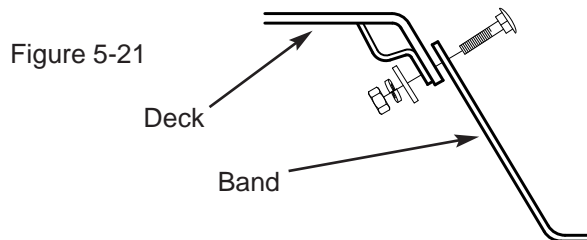
B. Before use, attach loose end of chain to towing vehicle attaching point such as drawbar or bumper, etc. Fasten chain back to itself with hook latch.



5-4 BAND INSTALLATION

A. **Raise wings to the transport position and install transport lock pins.** Bands will be installed to underside of deck (In the same arrangement as the rear chains in Figure 5-20).

B. Align holes on outer wing band with holes in wing skid. Install 3/8" x 1" bolt and nut to support band.



C. Align holes on bands with those on wing. Insert carriage bolts through deck and bands. Secure with lockwashers and nuts. Secure bands together using angle splice fasteners provided.

D. Tighten all nuts.

E. Align holes on center band with those on cutter center section. Insert carriage bolts through deck and bands. Secure with lockwashers and nuts.

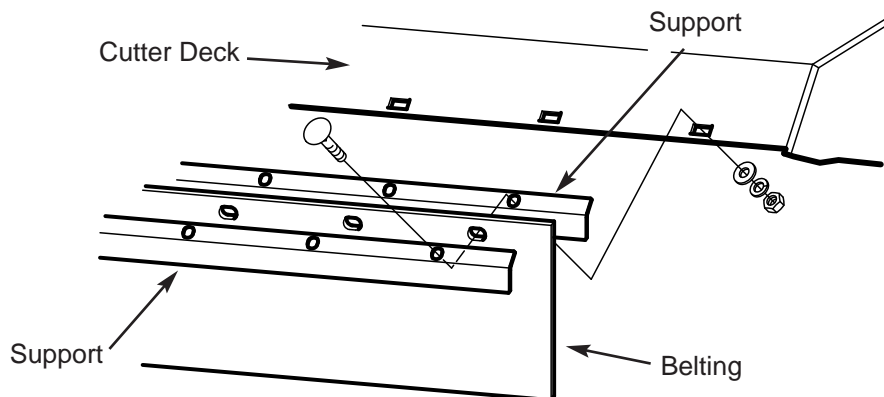
F. Tighten all nuts.

5-5 FRONT BELTING



FOR NON-AGRICULTURAL USE, OSHA, ASAE, SAE AND ANSI STANDARDS REQUIRE THE USE OF CHAIN GUARDS OR OTHER PROTECTIVE GUARDS AT ALL TIMES. BUSH HOG STRONGLY RECOMMENDS THE USE OF SUCH GUARDS FOR AGRICULTURAL USES AS WELL, TO REDUCE THE RISK OF PROPERTY DAMAGE, SERIOUS BODILY INJURY, OR EVEN DEATH FROM OBJECTS THROWN OUT BY OR FROM CONTACT WITH THE CUTTING BLADES.

Figure 5-22 Belting Installation



A. Compare each piece of belting and supports to Figure 5-20 to determine location for installation.

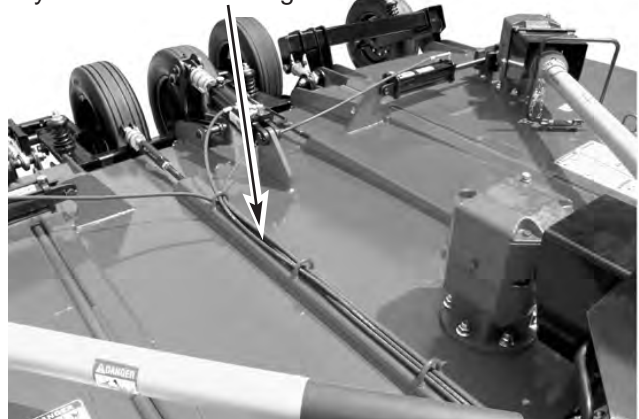
B. Place belting between two supports. Align holes in belt and support with those on cutter. Insert carriage bolts through deck, supports and belting. Secure with lockwashers and nuts. (Figure 5-22)

C. Tighten all nuts.

5-6 HYDRAULIC PLUMBING (Pages 28 & 29)

The hoses should be routed down the right hand side strong back through the loops and under the cross rod at the back of the tongue hitch plates and then up through the hose holder rod. There is one longer hose and it should be connected to the left section fold cylinder and routed under the axle lift cylinder before routing through the loops. (Figure 5-23)

Figure 5-23
Hydraulic Hose Routing



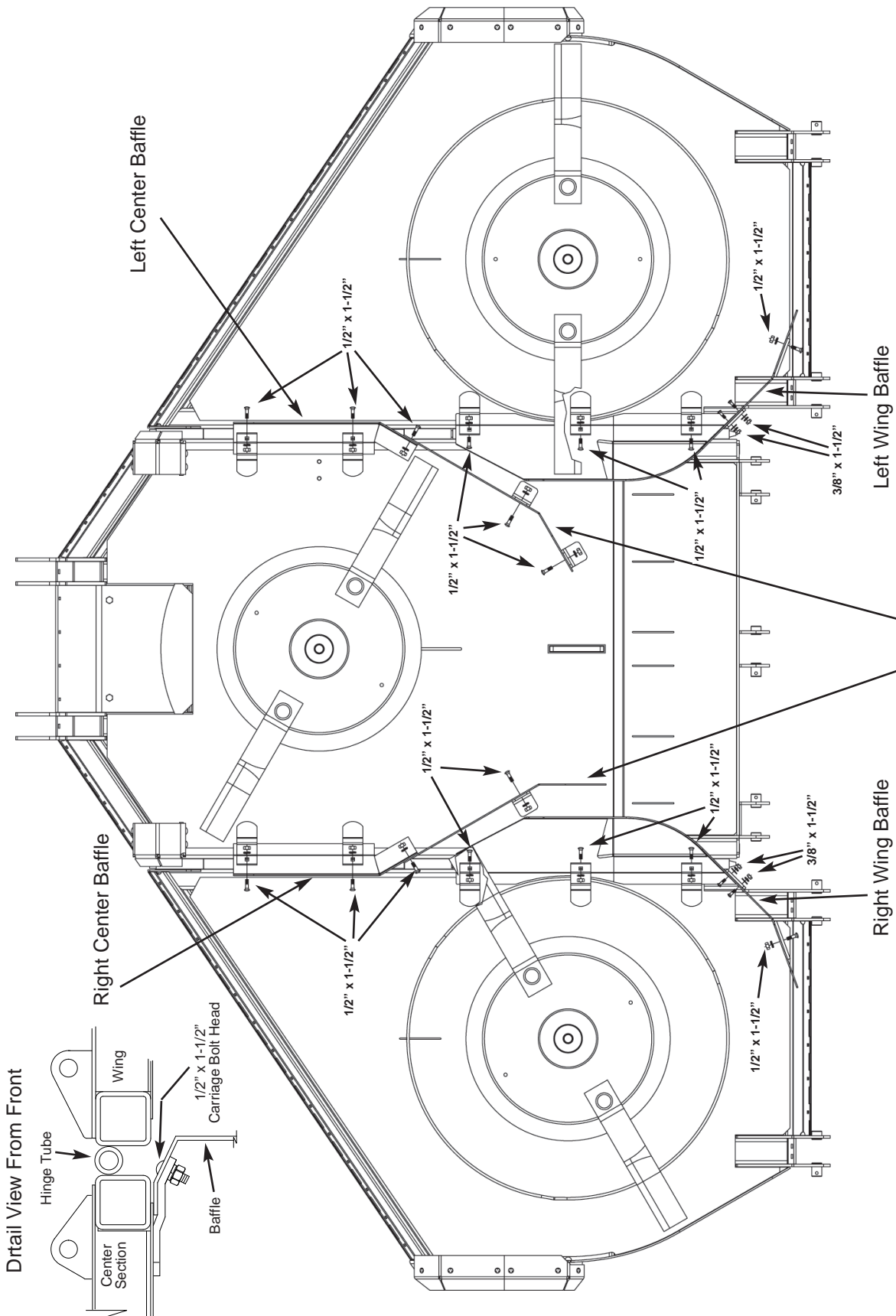
5-7 BAFFLE INSTALLATION

Refer to Figure 5-24 for arrangement of the various baffle components. Fasten the baffle parts to the underside of the cutter using (17) 1/2" x 1-1/4" Grade 5 carriage bolts, lockwashers and nuts and (4) 3/8" x 1-1/2" Grade 5 carriage bolts, flatwashers, lockwashers and nuts..

NOTE: The carriage bolts must be inserted so that the bolt head will be on the hinge side with the nut on the blade side. If the bolts are not correctly installed, they will contact the hinge area when the wing folds down 22°.

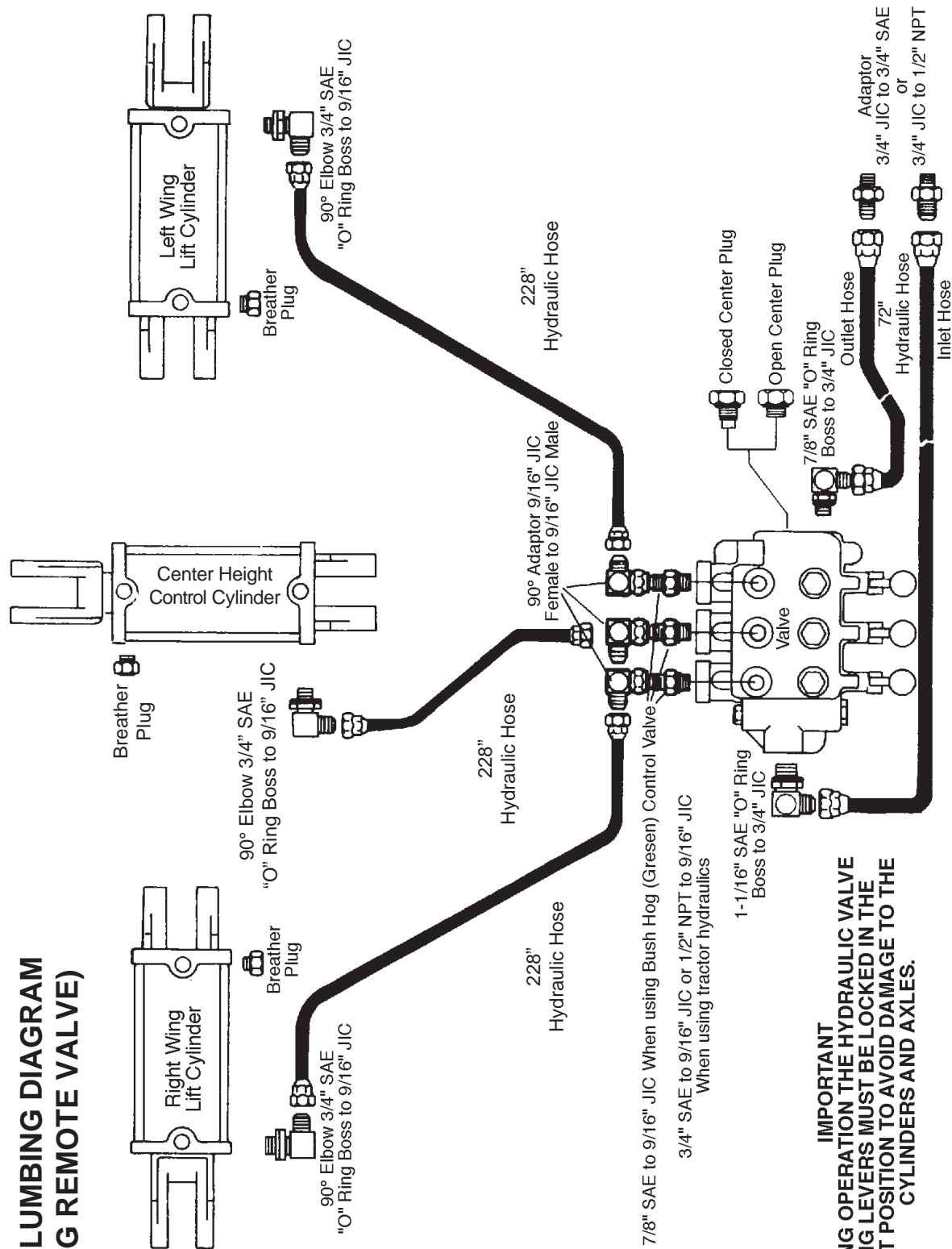
Figure 5-24

Baffle Locations (As Seen From Bottom Side)



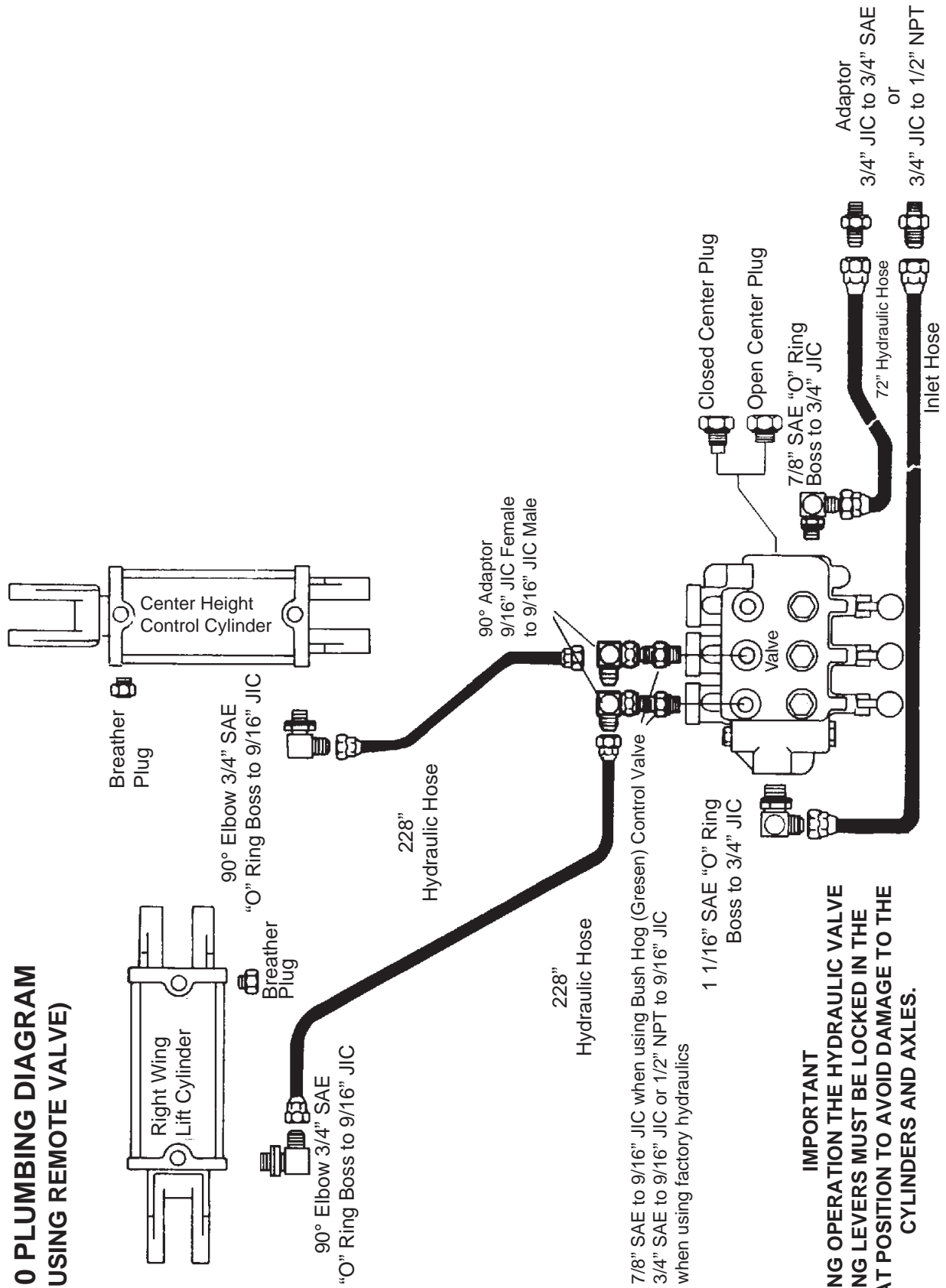
Note the bend angle of the center baffle extensions. The sides are interchangeable.

2715 PLUMBING DIAGRAM (USING REMOTE VALVE)



IMPORTANT
DURING OPERATION THE HYDRAULIC VALVE
WING LEVERS MUST BE LOCKED IN THE
FLOAT POSITION TO AVOID DAMAGE TO THE
CYLINDERS AND AXLES.

2710 PLUMBING DIAGRAM (USING REMOTE VALVE)



SAFETY DECALS

To promote safe operation, Bush Hog supplies safety decals on all products manufactured. Because damage can occur to safety decals either through shipment, use or reconditioning, Bush Hog will, upon request, provide safety decals for any of our products in the field at no charge. Contact your authorized Bush Hog dealer for more information.

⚠ WARNING





TO AVOID SERIOUS INJURY OR DEATH:

- READ OPERATOR'S MANUAL BEFORE OPERATING AND FOLLOW ALL PRECAUTIONS. (CONTACT DEALER FOR MANUAL)
- KEEP SHIELDS AND GUARDS IN PLACE. KEEP CLEAR OF DRIVES AND BELTS.
- LOWER IMPLEMENT, STOP ENGINE AND PTO, ALLOW ALL MOVING PARTS TO STOP, AND REMOVE KEY BEFORE DISMOUNTING FROM TRACTOR.
- KNOW HOW TO STOP TRACTOR AND EQUIPMENT QUICKLY IN AN EMERGENCY.
- ALLOW NO CHILDREN OR UNQUALIFIED PERSONS TO OPERATE EQUIPMENT.
- BE CAREFUL ON UNEVEN TERRAIN. DECREASE SPEED WHEN TURNING.
- DO NOT OPERATE MOWER IN TRANSPORT POSITION.

⚠ WARNING




IMPLEMENT CAN FALL FROM HYDRAULIC SYSTEM FAILURE. TO AVOID SERIOUS INJURY OR DEATH:

- SHUT OFF TRACTOR ENGINE, REMOVE KEY, SECURE TRACTOR PARKING BRAKE AND BLOCK UP OR SECURELY SUPPORT IMPLEMENT BEFORE WORKING UNDERNEATH.
- PURGE ALL AIR FROM HYDRAULIC SYSTEM BEFORE ATTEMPTING TO RAISE OR LOWER THIS IMPLEMENT.
- STAND CLEAR IF LOWERING OR RAISING IMPLEMENT.
- DO NOT USE HAND OR SKIN TO CHECK FOR HYDRAULIC LEAKS. USE CARDBOARD OR WOOD.
- HIGH PRESSURE OIL LEAKS CAN PENETRATE SKIN CAUSING SERIOUS INJURY AND GANGRENE. CONSULT A PHYSICIAN IMMEDIATELY.
- LOWER THE IMPLEMENT AND RELEASE HYDRAULIC PRESSURE BEFORE LOOSENING FITTINGS.
- REFER TO OWNER'S MANUAL FOR DETAILS.

⚠ WARNING





TO AVOID SERIOUS INJURY OR DEATH:

- DO NOT OPERATE WITH WINGS RAISED.
- LOCK WINGS UP FOR TRANSPORT.
- STAND CLEAR IF LOWERING OR RAISING WINGS.
- DECREASE SPEED WHEN TURNING. BE CAREFUL ON SLOPES OR UNEVEN TERRAIN WITH WINGS IN RAISED POSITION.
- BE ALERT TO OVERHEAD OBSTRUCTIONS AND ELECTRICAL WIRES WITH WINGS IN RAISED POSITION.

50029416

⚠ DANGER





KEEP AWAY - ROTATING BLADES

TO AVOID SERIOUS INJURY OR DEATH FROM BLADE CONTACT:

- LOWER IMPLEMENT, STOP ENGINE AND PTO, ALLOW ALL MOVING PARTS TO STOP, AND REMOVE KEY BEFORE DISMOUNTING FROM TRACTOR.
- ALLOW NO RIDERS ON TRACTOR OR MOWER.
- KEEP ALL PERSONS CLEAR OF OPERATING MOWER AND MOWING AREA.
- KEEP CLEAR OF ROTATING BLADES, PARTS, AND DRIVELINES.





PREVENT FALL OFF INTO ROTATING BLADES

TO PREVENT ACCIDENTAL FALL OFF FROM TRACTOR AND SERIOUS INJURY OR DEATH FROM RUN OVER OR ROLLOVER BY TRACTOR OR MOWER:

- USE ROPS (ROLLOVER PROTECTIVE STRUCTURES) AND SEAT BELT EQUIPPED TRACTORS FOR MOWING OPERATIONS.
- BUCKLE UP SEAT BELT.
- KEEP ALERT FOR STUMPS, HOLES, RUTS AND UNEVEN TERRAIN.

⚠ WARNING




ROTARY CUTTERS CAN DISCHARGE OBJECTS SEVERAL HUNDREDS OF FEET. TO AVOID SERIOUS INJURY OR DEATH TO BYSTANDERS FROM THROWN OBJECTS:

- CLEAR MOWING AREA OF VISIBLE DEBRIS AND USE EXTRA CAUTION WHERE ROCKS OR DEBRIS MAY BE PRESENT.
- DO NOT OPERATE CUTTER ALONG ROADWAYS OR IN THE VICINITY OF OTHER PERSONS WITHOUT ENCLOSED SIDES, PERMANENT BANDS, BELTING, HIGHWAY CHAINS OR OTHER FACTORY APPROVED DISCHARGE SHIELDS IN PLACE AND IN GOOD WORKING ORDER.
- KEEP ALL PERSONS WELL CLEAR OF MOWER WHEN IN OPERATION.

⚠ CAUTION

THIS IMPLEMENT IS DESIGNED TO OPERATE AT 540 RPM MAXIMUM TRACTOR PTO SPEED.

ALL DRIVE LINE SHIELDS MUST BE KEPT IN PLACE.

50029417

⚠ DANGER





KEEP AWAY - ROTATING BLADES

TO AVOID SERIOUS INJURY OR DEATH FROM BLADE CONTACT:

- LOWER IMPLEMENT, STOP ENGINE AND PTO. ALLOW ALL MOVING PARTS TO STOP, AND REMOVE KEY BEFORE DISMOUNTING FROM TRACTOR.
- ALLOW NO RIDERS ON TRACTOR OR MOWER.
- KEEP ALL PERSONS CLEAR OF OPERATING MOWER AND MOWING AREA.
- KEEP CLEAR OF ROTATING BLADES, PARTS, AND DRIVELINES.





PREVENT FALL OFF INTO ROTATING BLADES

TO PREVENT ACCIDENTAL FALL OFF FROM TRACTOR AND SERIOUS INJURY OR DEATH FROM RUN OVER OR ROLLOVER BY TRACTOR OR MOWER:

- USE ROPS (ROLLOVER PROTECTIVE STRUCTURES) AND SEAT BELT EQUIPPED TRACTORS FOR MOWING OPERATIONS.
- BUCKLE UP SEAT BELT.
- KEEP ALERT FOR STUMPS, HOLES, RUTS AND UNEVEN TERRAIN.

⚠ WARNING




ROTARY CUTTERS CAN DISCHARGE OBJECTS SEVERAL HUNDREDS OF FEET. TO AVOID SERIOUS INJURY OR DEATH TO BYSTANDERS FROM THROWN OBJECTS:

- CLEAR MOWING AREA OF VISIBLE DEBRIS AND USE EXTRA CAUTION WHERE ROCKS OR DEBRIS MAY BE PRESENT.
- DO NOT OPERATE CUTTER ALONG ROADWAYS OR IN THE VICINITY OF OTHER PERSONS WITHOUT ENCLOSED SIDES, PERMANENT BANDS, BELTING, HIGHWAY CHAINS OR OTHER FACTORY APPROVED DISCHARGE SHIELDS IN PLACE AND IN GOOD WORKING ORDER.
- KEEP ALL PERSONS WELL CLEAR OF MOWER WHEN IN OPERATION.

⚠ CAUTION

THIS IMPLEMENT IS DESIGNED TO OPERATE AT 1000 RPM MAXIMUM TRACTOR PTO SPEED.

ALL DRIVE LINE SHIELDS MUST BE KEPT IN PLACE.

50029418

50029418

⚠ DANGER



**GUARD MISSING
DO NOT OPERATE**

⚠ DANGER



**GUARD MISSING
DO NOT OPERATE**

⚠ DANGER

78786

⚠ DANGER



ROTATING DRIVELINE

CONTACT CAN CAUSE DEATH

KEEP AWAY!

DO NOT OPERATE WITHOUT -

- ALL DRIVELINE GUARDS, TRACTOR AND EQUIPMENT SHIELDS IN PLACE
- DRIVELINES SECURELY ATTACHED AT BOTH ENDS
- DRIVELINE GUARDS THAT TURN FREELY ON DRIVELINE



BONDIOLI & PAVESI

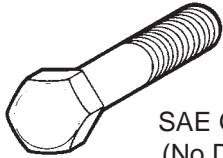
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TORQUE SPECIFICATIONS

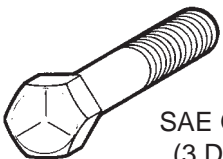
Proper torque for American fasteners used on Bush Hog equipment.
Recommended Torque in Foot Pounds (Newton Meters).*

AMERICAN

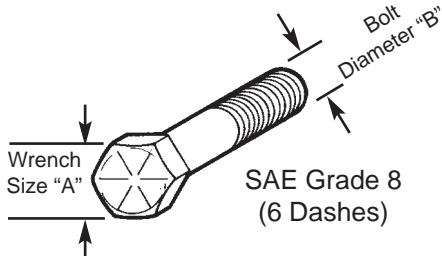
Bolt Head Markings



SAE Grade 2
(No Dashes)



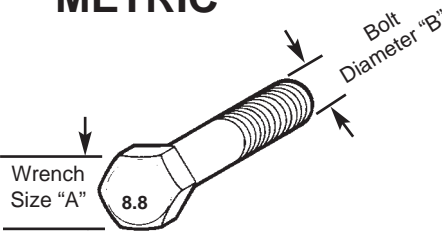
SAE Grade 5
(3 Dashes)



SAE Grade 8
(6 Dashes)

WRENCH SIZE (IN.) "A"	BOLT DIAMETER (IN.) "B" AND THREAD SIZE	SAE GRADE 2	SAE GRADE 5	SAE GRADE 8
7/16	1/4 - 20 UNC	6 (7)	8 (11)	12 (16)
7/16	1/4 - 28 UNF	6 (8)	10 (13)	14 (18)
1/2	5/16 - 18 UNC	11 (15)	17 (23)	25 (33)
1/2	5/16 - 24 UNF	13 (17)	19 (26)	27 (37)
9/16	3/8 - 16 UNC	20 (27)	31 (42)	44 (60)
9/16	3/8 - 24 UNF	23 (31)	35 (47)	49 (66)
5/8	7/16 - 14 UNC	32 (43)	49 (66)	70 (95)
5/8	7/16 - 20 UNF	36 (49)	55 (75)	78 (106)
3/4	1/2 - 13 UNC	49 (66)	76 (103)	106 (144)
3/4	1/2 - 20 UNF	55 (75)	85 (115)	120 (163)
7/8	9/16 - 12 UNC	70 (95)	109 (148)	153 (207)
7/8	9/16 - 18 UNF	79 (107)	122 (165)	172 (233)
15/16	5/8 - 11 UNC	97 (131)	150 (203)	212 (287)
15/16	5/8 - 18 UNF	110 (149)	170 (230)	240 (325)
1-1/8	3/4 - 10 UNC	144 (195)	266 (360)	376 (509)
1-1/8	3/4 - 16 UNF	192 (260)	297 (402)	420 (569)
1-5/16	7/8 - 9 UNC	166 (225)	430 (583)	606 (821)
1-5/16	7/8 - 14 UNF	184 (249)	474 (642)	668 (905)
1-1/2	1 - 8 UNC	250 (339)	644 (873)	909 (1232)
1-1/2	1 - 12 UNF	274 (371)	705 (955)	995 (1348)
1-1/2	1 - 14 UNF	280 (379)	721 (977)	1019 (1381)
1-11/16	1-1/8 - 7 UNC	354 (480)	795 (1077)	1288 (1745)
1-11/16	1-1/8 - 12 UNF	397 (538)	890 (1206)	1444 (1957)
1-7/8	1-1/4 - 7 UNC	500 (678)	1120 (1518)	1817 (2462)
1-7/8	1-1/4 - 12 UNF	553 (749)	1241 (1682)	2013 (2728)
2-1/16	1-3/8 - 6 UNC	655 (887)	1470 (1992)	2382 (3228)
2-1/16	1-3/8 - 12 UNF	746 (1011)	1672 (2266)	2712 (3675)
2-1/4	1-1/2 - 6 UNC	870 (1179)	1950 (2642)	3161 (4283)
2-1/4	1-1/2 - 12 UNF	979 (1327)	2194 (2973)	3557 (4820)

METRIC

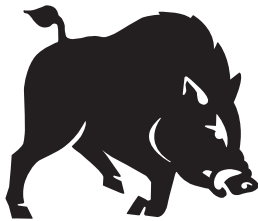


Numbers appearing on bolt heads
indicate ASTM class.

Proper torque for metric fasteners used on Bush Hog equipment.
Recommended torque in foot pounds (newton Meters).*

WRENCH SIZE (mm) "A"	BOLT DIA. (mm) "B"	ASTM 4.6	ASTM 8.8	ASTM 9.8	ASTM 10.9
8	5	1.8 (2.4)		5.1 (6.9)	6.5 (8.8)
10	6	3 (4)		8.7 (12)	11.1 (15)
13	8	7.3 (10)		21.1 (29)	27 (37)
16	10	14.5 (20)		42 (57)	53 (72)
18	12	25 (34)	74 (100)	73 (99)	93 (126)
21	14	40 (54)	118 (160)	116 (157)	148 (201)
24	16	62 (84)	167 (226)	181 (245)	230 (312)
30	20	122 (165)	325 (440)		449 (608)
33	22		443 (600)		611 (828)
36	24	211 (286)	563 (763)		778 (1054)
41	27		821 (1112)		1138 (1542)
46	30	418 (566)	1119 (1516)		1547 (2096)

*Use 75% of the specified torque value for plated fasteners. Use 85% of the specified torque values for lubricated fasteners.



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